977/3

Vol. 977 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 19, 1978

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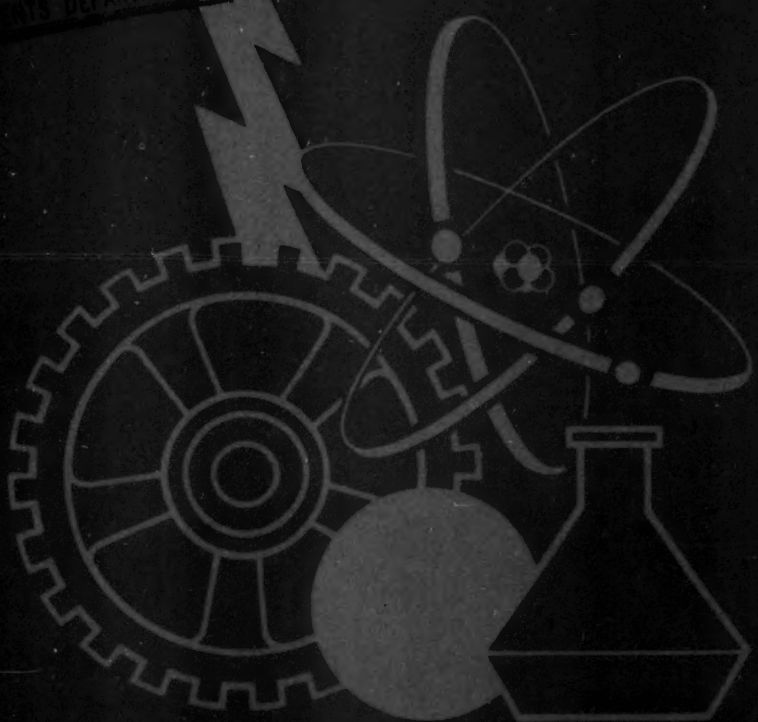

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

December 19, 1978 Volume 977 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Examination

Due to budgetary constraints, only one examination for registration to practice before the United States Patent and Trademark Office as patent attorneys or agents will be given in FY 1979 which ends on September 30, 1979. Pursuant to the provisions of Rule 341(c), the FY 1979 examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys or agents will be held on April 9, 1979.

All persons registered to practice in patent cases before the Patent and Trademark Office must, pursuant to the noted rule, take and pass the examination, with the exception of former patent examiners for whom the examination is waived. Those passing the examination do not thereby qualify for recognition for practice before the Patent and Trademark Office in trademark cases. Recognition for practice in *trademark* cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

The examination will be given under the supervision of the Civil Service Commission, and may be taken in any of the cities in which the Civil Service Commission regularly conducts examinations. Applications to take the April 9, 1979 examination must be filed in the Patent and Trademark Office together with a $35 fee not later than January 31, 1979.

Application blanks may be obtained from the Clerk of the Patent and Trademark Office Committee on Enrollment, Bldg. 3, 11th Floor, Room C16, Crystal Plaza, Arlington, Va. or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

LUTRELLE F. PARKER,
Nov. 22, 1978. *Chairman, Committee on Enrollment.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before January 6, 1979.

Asbury, Walter M., 1311 Hancock Ave., Alexandria, Va. 22301

Nelson, Juanita D., 3902 21st Ave., Hillcrest Hgts., Md. 20031

Schaefer, Robert K., 7735 Falstaff Rd., McLean, Va. 22102

LUTRELLE F. PARKER,
Nov. 16, 1978. *Chairman, Committee on Enrollment.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examiniag Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,753,535, Re. S.N. 952,937, Filed Oct. 19, 1978, Cl. 242/152.1, YARN TENSIONING DEVICE AND METHOD, Otto Zollinger, Owner of Record: *Otto Zollinger Inc., Spartanburg, S.C.,* Attorney or Agent: Wellington M. Manning Jr., et al., Ex. Gp.: 242

3,874,613, Re. S.N. 952,939, Filed Oct. 19, 1978, Cl. 242/152.1, YARN TENSIONING DEVICE, Otto Zollinger, Owner of Record: *Otto Zollinger Inc., Spartanburg, S.C.,* Attorney or Agent: Wellington M. Manning Jr., et al., Ex. Gp.: 242

3,892,371, Re. S.N. 952,938, Filed Oct. 19, 1978, Cl. 242/152.1, YARN TENSIONING DEVICE, Otto Zollinger, Owner of Record: *Otto Zollinger Inc., Spartanburg, S.C.,* Attorney or Agent: Wellington M. Manning Jr., et al., Ex. Gp.: 242

3,924,989, Re. S.N. 952,527, Filed Oct. 18, 1978, Cl. 425/130, MACHINE FOR PRODUCING MOLDINGS FROM CHEMICAL COMPONENTS WHICH REACT QUICKLY WITH ONE ANOTHER, Ferdinand Althausen, et al., Owner of Record: *Bayer Aktiengesellschaft; Maschinefabrik Hennecke GmbH; both of Leverkusen, Bayerwerk, Germany,* Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 322

3,951,490, Re. S.N. 953,288, Filed Oct. 20, 1978, Cl. 339/17 C, CABLE SYSTEM DISTRIBUTION SUBSTATION WITH NOVEL CENTER CONDUCTOR SEIZURE APPARATUS, Alan E. Devendorf, Owner of Record: *The Magnavox Company, Fort Wayne, Ind.,* Attorney or Agent: Jack Oisher, Ex. Gp.: 322

3,976,115, Re. S.N. 953,653, Filed Oct. 23, 1978, Cl. 152/361 R, PNEUMATIC TIRE, Henri J. Mirtain, et al., Owner of Record: *Uniroyal, Inc., Clairoix, France,* Attorney or Agent: Jack Posin, Ex. Gp.: 314

3,979,437, Re. S.N. 952,918, Filed Oct. 19, 1978, Cl. 260/471 R, SUBSTITUTED PHENOXYBENZOIC ACIDS AND DERIVATIVES THEREOF, Robert J. Theissen, Owner of Record: *Mobil Oil Corp., New York, N.Y.,* Attorney or Agent: Michael G. Gilman, Ex. Gp.: 126

4,030,026, Re. S.N. 949,004, Filed Oct. 5, 1978, Cl. 324/3, SAMPLING METAL DETECTOR, George Calvin Payne, Owner of Record: *White's Electronics, Inc., Sweet Home, Oreg.,* Attorney or Agent: Kenneth S. Klarquist, et al., Ex. Gp.: 252

4,087,702, Re. S.N. 946,823, Filed Sep. 28, 1978, Cl. 307/252 B, DIGITAL ELECTRONIC DIMMER, James P. Kirby, et al., Owner of Record: *Inventor,* Attorney or Agent: Jerry M. Keys, Ex. Gp.: 254

4,089,419, Re. S.N. 953,106, Filed Oct. 20, 1978, Cl. 206/632, REVERSIBLE ENVELOPE, Robert S. Yale, Owner of Record: *Inventor,* Attorney or Agent: Leo A. Rosetta, et al., Ex. Gp.: 241

4,099,416, Re. S.N. 945,597, Filed Sep. 25, 1978, Cl. 73/602, RESOLUTION REAL-TIME ULTRASONIC IMAGING APPARATUS, Ludwig Niklas, Owner of Record: *Krautkramer-Branson, Incorporated, Stamford, Conn.,* Attorney or Agent: Ervin B. Steinberg, et al., Ex. Gp.: 244

PATENT NOTICES

Certificates of Correction for the Week of Dec. 19, 1978

Re. 29,689	4,087,319	4,096,103	4,112,949
Re. 29,690	4,087,923	4,096,112	4,112,950
Re. 29,691	4,088,112	4,096,399	4,113,285
D. 248,339	4,088,323	4,096,454	4,113,326
3,695,554	4,088,605	4,096,742	4,113,330
3,807,069	4,088,965	4,096,854	4,113,722
3,828,411	4,089,228	4,097,179	4,113,725
3,874,698	4,089,525	4,097,268	4,113,739
3,930,709	4,090,354	4,097,318	4,113,867
3,942,260	4,090,697	4,097,384	4,113,911
3,953,414	4,091,310	4,097,389	4,114,006
3,985,294	4,091,510	4,097,399	4,114,274
4,021,474	4,092,250	4,097,544	4,114,460
4,035,584	4,092,351	4,097,581	4,114,613
4,040,265	4,092,468	4,097,590	4,114,862
4,047,663	4,092,759	4,097,690	4,114,920
4,048,452	4,092,784	4,097,890	4,114,993
4,049,516	4,093,002	4,097,920	4,115,339
4,050,780	4,093,336	4,097,983	4,115,488
4,052,161	4,093,416	4,098,126	4,115,803
4,054,499	4,093,537	4,098,255	4,115,805
4,055,191	4,093,589	4,098,499	4,115,806
4,059,180	4,093,644	4,098,508	4,116,456
4,064,206	4,093,877	4,098,705	4,116,457
4,066,732	4,094,107	4,098,906	4,116,584
4,070,341	4,094,282	4,099,126	4,116,607
4,077,797	4,094,395	4,099,338	4,116,644
4,077,984	4,094,585	4,099,535	4,116,649
4,078,788	4,094,647	4,099,664	4,116,727
4,078,970	4,094,703	4,099,785	4,116,885
4,079,256	4,094,727	4,099,891	4,116,923
4,079,318	4,094,770	4,100,082	4,117,204
4,080,658	4,094,850	4,100,308	4,117,347
4,080,667	4,094,871	4,100,312	4,117,372
4,081,075	4,094,888	4,100,345	4,117,385
4,082,009	4,095,154	4,100,382	4,117,467
4,082,011	4,095,251	4,100,903	4,117,626
4,083,684	4,095,370	4,101,257	4,117,718
4,083,728	4,095,621	4,101,326	4,117,809
4,083,797	4,095,766	4,101,372	4,117,839
4,083,835	4,095,931	4,101,583	4,117,891
4,084,249	4,095,947	4,101,751	4,117,953
4,084,641	4,095,966	4,101,926	4,118,044
4,084,785	4,095,981	4,112,779	4,118,331
4,085,725	4,096,047	4,112,780	4,118,349
4,086,348	4,096,084	4,112,803	4,118,761

Patents Available for Licensing or Sale

3,688,257. AUTOMOBILE ANTI-THEFT DEVICE. Thomas A. Mann, 73 Hosford Ave., Leonardo, N.J. 07737.

3,924,901. PARTICLE BUILD-UP SUPPRESSOR. Woodrow W. Phillips, 815 North Gilmore Ave., #105, Lakeland, Fla. 33801.

3,970,423. OXIDATIVE HAIR DYE COMPOSITIONS. Frederick Brody and Stanley Pohl. Correspondence to: Irving Holtzman, Bristol-Myers Company, 345 Park Ave., New York, N.Y. 10022.

4,071,004. ELECTRO-STATIC FUEL MIXTURE SYSTEM. Neil Ostergaard, 1454 East Gateway Circle, Apt. 12, Fargo, N. Dak. 58103.

4,107,967. ACCESS LIMITING APPARATUS. William C. Grabb, 325 Barton Shore Drive, Ann Arbor, Mich. 48105.

The following two patents are offered by Blanche A. Morley, 3401 N. Franklin Ave., Stockton, Calif. 95204.

D. 249,662. SINGLE BOWLING BALL CADDY.

D. 249,492. DUAL BOWLING BALL CADDY.

The following five patents are offered for sale. Inquiries should be directed to David C. Jacobson, Esq., 8000 Sears Tower, Chicago, Ill. 60606.

3,960,313. AUTOMATIC SETUP CARTON CONSTRUCTIONS.

3,964,374. CARTON FOLDING AND GLUEING DEVICE.

4,007,869. CORRUGATED CARTON CONSTRUCTIONS.

4,012,996. APPARATUS FOR FOLDING AND COMPRESSION OF CORRUGATED CONTAINER BLANKS.

Re. 29,442. APPARATUS FOR PRODUCING CARTONS.

The following patents are offered by: Henry C. Kovar, % The Cornelius Company, 2727 North Ferry St., Anoka, Minn. 55303.

3,283,947. BOTTLE CARRIER.

3,297,196. BOTTLE CARRIER.

3,317,081. BOTTLE CARRIER.

3,334,767. BOTTLE CARRIER FOR SIX-PACKS.

3,363,802. LARGE CAPACITY MOLDED PLASTIC BOTTLE CARRIER.

3,376,998. MOLDED PLASTIC BOTTLE CARRIER.

3,384,261. BOTTLE CARRIER.

3,456,344. PLURAL DRINKING STRAWS INTEGRALLY CONNECTED FUNCTIONING AS A STICK-LIKE SPOON.

3,578,194. THROW-AWAY BEVERAGE BOTTLES.

The following patents are offered by: Jackson and Chovanes, 1 Bala-Cynwyd Plaza, Suite 319, Bala-Cynwyd, Pa. 19004.

4,080,225. LOW TEMPERATURE, WELDABLE, LOW ALLOY STEEL.

4,065,331. ROLLED LOW CARBON NIOBIUM STEEL.

3,738,874. LOW TEMPERATURE STEEL PROCESS.

3,721,587. LOW CARBON, NIOBIUM AND ALUMINUM CONTAINING STEEL SHEETS AND PLATES AND PROCESS.

3,672,595. DRAG WIPE.

3,619,303. LOW ALLOY AGE-HARDENABLE STEEL AND PROCESS.

3,559,862. DRAG WIPE.

The General Electric Company is prepared to grant non-exclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Application for licenses may be addressed to: General Electric Company, Component Products Group 101 E. Carmel Drive, Suite 205, Carmel, Ind. 46032.

3,077,570. INDUCTIVE DEVICE.

3,350,572. HIGH FREQUENCY CHOPPER CIRCUIT.

3,600,668. TIME RATIO SOLID STATE VOLTAGE REGULATOR.

3,700,960. METAL HALIDE LAMP SYSTEM.

3,731,179. ADJUSTABLE HIGH VOLTAGE POWER SUPPLY WITH OUTPUT POLARITY SWITCHING.

3,766,467. INVERTER-OSCILLATOR.

3,767,970. TURN ON/TURN OFF CIRCUIT FOR THE DIRECT CURRRENT OPERATION OF GASEOUS DISCHARGE LAMPS.

Application for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Company, 1 River Road, Building #500, Room 218, Schenectady, N.Y. 12345.

4,081,956. COMBINED GAS TURBINE AND STEAM TURBINE POWER PLANT.

Application for licenses should be addressed to: Division Patent Counsel, Space Division General Electric Company, P.O. Box 8555, Philadelphia, Pa. 19101.

4,085,425. PRECISE CONTROL OF TELEVISION PICTURE SIZE AND POSITION.

4,089,576. INSULATED CONNECTION OF PHOTOVOLTAIC DEVICES.

4,117,344. CONTROL SYSTEM FOR A RANKINE CYCLE POWER UNIT.

4,118,643. COMPLAINT MHD ELECTRODE STRUCTURE.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patent
Washington, D.C. 20545

Patent 4,062,404. Method for in Situ Combustion. Filed Sept. 30, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,090. Method for Isotope Separation by Photodeflection. Filed Oct. 30, 1974. Patented Dec. 13, 1977. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Building, Bethesda, Md. 20014

Patent application 885,340. Improved Procedure for the Preparation of 9-Beta-D-Arabinofuranosyl - 2 - Fluoroadenine. Filed Mar. 10, 1978.

Patent application 886,119. A Cobalt-Catalyzed One-Step Synthesis of Annulated Pyridines and Novel Products. Filed Mar. 13, 1978.

Patent application 900.641. Scanning Flow Indicator for Rotameters. Filed Apr. 25, 1978.

Patent application 916,209. Portable Instrument for Measuring Neutron Energy Spectra and Neutron Dose in a Mixed N-Gamma Field. Filed June 16, 1978.

Patent application 928,155. Multifinger Photocell Plethysmography System. Filed July 26, 1978.

Patent 4,078,628. Double-Wheel Automotive Hand Control System. Filed Aug. 16, 1976. Patented Mar. 14, 1978. Not available NTIS.

Patent 4,084,266. Artificial Implant With Fiber-Flocked Blood-Contacting Surface. Filed Nov. 1, 1976. Patented Apr. 18, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 804,193. Method of Inhibiting Fungal Growth With Obtusastyrene. Filed June 6, 1977.

Patent application 884,075. Automatic Electrical Load Matching Device for Wind Generators. Filed Mar. 6, 1978.

Patent application 888,122. A Method of Lasing With 7-Hydroxy-Coumarin-8–Methyleneiminobisacetic Acid and Metal Complexes Thereof. Filed Mar. 20, 1978.

Patent application 903,464. Coal Liquefaction. Filed May 8, 1978.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent application 916,654. Supercritical Fuel Injection System. Filed June 19, 1978.

Patent application 918,534. Apparatus for Measuring Semiconductor Device Resistance. Filed June 23, 1978.

Patent application 928,133. Method of Fabricating a Photovoltaic of a Substantially Transparent Construction. Filed July 26, 1978.

Patent application 928,137. A Signal Attenuator. Filed July 26, 1978.

Patent application 929,084. Method of Cold Welding Using Ion Beam Technology. Filed July 28, 1978.

Patent application 929,086. Structural Wood Panels With Improved Fire Resistance. Filed July 28, 1978.

Patent application 931,217. Redundant Motor Drive System. Filed Aug. 4, 1978.

Patent 4,085,004. Control for Nuclear Thermionic Power Source. Filed Nov. 21, 1975. Patented Apr. 18, 1978. Not available NTIS.

Patent 4,088,291. Rotary Leveling Base Platform. Filed Nov. 2, 1976. Patented May 9, 1978. Not available NTIS.

Patent 4,088,951. Microcomputerized Electric Field Meter Diagnostic and Calibration System. Filed Mar. 24, 1977. Patented May 9, 1978. Not available NTIS.

Patent 4,088,999. RF Beam Center Location Method and Apparatus for Power Transmission System. Filed May 21, 1976. Patented Mar. 9, 1978. Not available NTIS.

Patent application 928,128. Driver for Solar Cell I-V Characteristic Plots. Filed July 26, 1978.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 3,986,149. High Power Reciprocal Co-Planar Waveguide Phase Shifter. Filed Aug. 29, 1975. Patented Oct. 12, 1976.

Patent 3,986,688. Variable Effectiveness Stabilizing/Controlling Surface. Filed June 16, 1975. Patented Oct. 19, 1976.

Patent 3,987,003. Thermally Stable Dioxo and Dithio-Benziso-quinoline Compositions and Process of Synthesizing Same. Filed June 6, 1975. Patented Oct. 19, 1976.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patent
Washington, D.C. 20545

Patent 3,949,596. Leak Test Fixture and Method for Using Same. Filed Dec. 11, 1974. Patented Apr. 13, 1976 .

Patent 3,950,216. Falling Film Evaporator. Filed Jan. 18, 1974. Patented Apr. 13, 1976.

Patent 3,951,074. Secondary Lift for Magnetically Levitated Vehicles. Filed Sept. 27, 1974. Patented Apr. 20, 1976.

Patent 3,951,082. Countercurrent Flow Afterburner. Filed Apr. 22, 1975. Patented Apr. 20, 1976.

Patent 3,951,327. Ceramic to Metal Seal. Filed Jan. 28, 1975. Patented Apr. 20, 1976.

Patent 3,952,263. Fission Fragment Excited Laser System. Filed Oct. 4, 1974. Patented Apr. 20, 1976.

Patent 3,953,285. Nickel-Chromium-Silicon Brazing Filler Metal. Filed Apr. 25, 1973. Patented Apr. 27, 1976.

Patent 3,953,355. Preparation of Uranium Nitride. Filed May 29, 1974. Patented Apr. 27, 1976.

Patent 3,954,321. Miniature Electrical Connector. Filed Aug. 13, 1975. Patented May 4, 1976.

Patent 3,955,150. Active-R Filter. Filed Jan. 15, 1975. Patented May 4, 1976.

Patent 3,955,505. Detonating Apparatus. Filed May 31, 1950. Patented May 11, 1976.

Patent 3,955,509. Fuel-Air Munition and Device. Filed Mar. 21, 1969. Patented May 11, 1976.

Patent 3,955,755. Closed Continuous-Flow Centrifuge Rotor. Filed Apr. 25, 1975. Patented May 11, 1976.

Patent 3,956,039. High Explosive Compound. Filed Jan. 13, 1956. Patented May 11, 1976.

Patent 3,957,197. Centrifuge Apparatus. Filed Apr. 25, 1975. Patented May 18, 1976.

Patent 3,957,460. Oxidation of Coal—Water Slurry Feed to Hycrogasifier. Filed Sept. 9, 1975. Patented May 18, 1976.

Patent 3,957,496. Molybdenum Sealing Glass-Ceramic Composition. Filed Sept. 23, 1975. Patented May 18, 1976.

Patent 3,957,532. Method of Preparing an Electrode Material of Lithium—Aluminum Alloy. Filed June 20, 1974. Patented May 18, 1976.

Patent 3,960,083. Igniter Containing Titanium Hydride and Potassium Perchlorate. Filed Mar. 6, 1975. Patented June 1, 1976.

Patent 3,961,016. Method of Removing Carbon Monoxide From Gases. Filed Apr. 26, 1974. Patented June 1, 1976.

Patent 3,963,598. Flash Hydrogenation of Coal. Filed Oct. 15, 1974. Patented June 15, 1976.

Patent 3,963,626. Fire Extinguishant for Fissionable Material. Filed Mar. 22, 1974. Patented June 15, 1976.

Patent 3,963,826. Low Temperature, Low Pressure Hydrogen Gettering. Filed Mar. 21, 1975. Patented June 15, 1976.

Patent 3,963,994. Slit Injection Device. Filed Jan. 15, 1975. Patented June 15, 1976.

Patent 3,964,792. Explosive Fluid Transmitted Shock Method for Mining Deeply Buried Coal. Filed Jan. 28, 1975. Patented June 22, 1976.

Patent 3,964,914. Electromarking Solution. Filed Aug. 16, 1974. Patented June 22, 1976.

Patent 3,965,351. Differential Auger Spectrometry. Filed Oct. 30, 1974. Patented June 22, 1976.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 3,925,648. Apparatus for the Generation of a High Capacity Chirp-Z Transform. Filed July 11, 1974. Patented Dec. 9, 1975.

Patent 3,986,681. Cylindrical Manifold for EGD Channels of a Static Discharge System. Filed Sept. 15, 1975. Patented Oct. 19, 1976.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 3,993,269. Toroidal Tail Structure for Tethered Aeroform Balloon. Filed Dec. 18, 1975. Patented Nov. 23, 1976.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patent
Washington, D.C. 20545

Patent 3,953,288. Gas Venting. Filed Mar. 24, 1970. Patented Apr. 27, 1976.

Patent 3,952,204. Film Holder for Radiographing Tubing. Filed Jan. 14, 1975. Patented Apr. 20, 1976.

Patent 3,953,922. Method of Eliminating the Training Effect in Superconducting Coils by Post-Wind Preload. Filed Feb. 24, 1975. Patented May 4, 1976.

Patent 3,955,757. Ultracentrifuge for Separating Fluid Mixtures. Filed Sept. 28, 1960. Patented May 11, 1976.

Patent 3,955,943. Diffusion Method of Separating Gaseous Mixtures. Filed June 16, 1948. Patented May 11, 1976.

Patent 3,958,096. Welding Arc Gap Ionization Device. Filed Dec. 23, 1974. Patented May 18, 1976.

Patent 3,959,172. Process for Encapsulating Radionuclides. Filed Sept. 26, 1973. Patented May 25, 1976.

Patent 3,961,197. X-Ray Generator. Filed Aug. 21, 1974. Patented June 1, 1976.

Patent 3,961,917. Method of Independently Operating a Group of Stages Within a Diffusion Cascade. Filed July 13, 1949. Patented June 8, 1976.

Patent 3,962,082. Liquid Metal Cold Trap. Filed Mar. 28, 1975. Patented June 8, 1976.

Patent 3,963,921. Method for Producing Uranium Atomic Beam Source. Filed Apr. 16, 1974. Patented June 15, 1976.

Patent 3,964,667. Diffusion Bonding. Filed Jan. 19, 1966. Patented June 22, 1976.

Patent 3,965,250. Separation of Sulfur Isotopes. Filed July 3, 1974. Patented June 22, 1976.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW.
Washington, D.C. 20240

Patent 3,992,153. Dosimeter for Oxides of Nitrogen. Filed May 20, 1976. Patented Nov. 16, 1976.

Patent 3,992,327. Catalysts and Adsorbents Having High Surface Area to Weight. Filed Nov. 11, 1974. Patented Nov. 16, 1976.

Patent 3,993,517. Thin Cell Electromembrane Separator. Filed Oct. 31, 1975. Patented Nov. 23, 1976.

Patent 3,993,838. Wax or Plastic Coated Phosphor Grains. Filed Mar. 3, 1975. Patented Nov. 23, 1976.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 3,976,274. Permanent Attachment for Suction Cups. Filed May 27, 1975. Patented Aug. 24, 1976.

Patent 3,984,673. External Lighting System for Hypobaric and Hyperbaric Chambers. Filed June 30, 1975. Patented Oct. 5, 1976.

Patent 3,989,475. Composite Superconductors. Filed May 30, 1975. Patented Nov. 2, 1976.

TENNESSEE VALLEY AUTHORITY
Division of Law, Muscle Shoals, Ala. 35660

Patent 3,985,538. Pipe Reactor-Continuous Ammoniator Process for Production of Granular Phosphates. Filed May 16, 1975. Patented Oct. 12, 1976.

Patent 3,991,225. Method for Applying Coatings to Solid Particles. Filed Dec. 12, 1974. Patented Nov. 9, 1976.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent 3,750,035. Frequency Discriminator and Phase Detector Circuit. Patented July 31, 1973.

Patent 3,990,860. High Temperature Oxidation Resistant Cermet Compositions. Patented Nov. 9, 1976.

Patent 3,990,987. Smoke Generator. Patented Nov. 9, 1976.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 4,000,697. Mechanical Retention System for Use With Caseless Ammunition. Filed Aug. 10, 1972. Patented Jan. 4, 1977.

Patent 4,000,776. Heat Pipe System. Filed Dec. 3, 1974. Patented Jan. 4, 1977.

Patent 4,000,855. Bellcrank Assembly, Nozzle Actuator. Filed Apr. 14, 1975. Patented Jan. 4, 1977.

Patent 4,001,135. Fluorine Generating Solid Formulation for Use in Chemical Lasers. Filed July 1, 1975. Patented Jan. 4, 1977.

Patent 4,001,136. Fluorine Generating Formulation for Use in Chemical Lasers. Filed July 1, 1975. Patented Jan. 4, 1977.

Patent 4,001,821. High Power Microwave Radar Pulse Shaping System. Filed June 16, 1975. Patented Jan. 4, 1977.

Patent 4,003,658. Triangular Interferometric Light-Source Tracker. Filed July 26, 1974. Patented Jan. 18, 1977.

Patent 4,004,465. Optical Window Protective Shutter Mechanism. Filed Jan. 20, 1976. Patented Jan. 25, 1977.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch General Service
Division, Federal Bldg., Agricultural Research Service
Hyattsville, Md. 20782

Patent 4,009,325. Photodegradable Polyolefin Composition Containing an N-Halo Urethane. Filed Apr. 2, 1976. Patented Feb. 22, 1977.

Patent 4,011,752. Adaptive Speed and Direction Analyzer. Filed Feb. 6. 1976. Patented Mar. 15, 1977.

Patent 4,012,529. Control of Marine Borer Attack on Wood. Filed Mar. 15, 1976. Patented Mar. 15, 1977.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patent
Washington, D.C. 20545

Patent 3,952,246. Plasma Digital Density Determining Device. Filed May 29, 1975. Patented Apr. 20, 1976.

Patent 3,958,079. Real Time, TV Based, Point-Image Quantizer and Sorter. Filed Apr. 25, 1975. Patented May 18, 1976.

Patent 3,959,710. Method for Exciting Inductive-Resistive Loads With High and Controllable Direct Current. Filed Dec. 31, 1974. Patented May 25, 1976.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patent
Washington, D.C. 20545

Patent 3,949,048. Separation by Solvent Extraction. Filed July 24, 1950. Patented Apr. 6, 1976.

Patent 3,953,567 ^{85}Sr-^{85}Rb Radioisotope Generator. Filed Sept. 27, 1974. Patented Apr. 27, 1976.

Patent 3,954,655. Method of Tagging Sand With Ruthenium 103 and the Resultant Product. Filed Dec. 27, 1974. Patented May 4, 1976.

Patent 3,954,661. Calcination Process for Radioactive Wastes. Filed Sept. 19, 1974. Patented May 4, 1976.

Patent 3,955,093. Targets for the Production of Radioisotopes and Method of Assembly. Filed Apr. 25, 1975. Patented May 4, 1976.

Patent 3,955,860. Journal Bearing. Filed Feb. 7, 1949. Patented May 11, 1976.

Patent 3,956,658. Low Impedance Switch. Filed Nov. 28, 1945. Patented May 11, 1976.

Patent 3,957,676. Chemical Digestion of Low Level Nuclear Solid Waste Material. Filed Sept. 22, 1972. Patented May 18, 1976.

Patent 3,958,948. Dissolver Vessel Bottom Assembly. Filed Jan. 8, 1975. Patented May 25, 1976.

Patent 3,960,468. Fluid Lubricated Bearing Assembly. Filed July 16, 1946. Patented June 1, 1976.

Patent 3,965,237. Dissolution Process for ZrO_2-UO_2-CaO Fuels. Filed Apr. 11, 1975. Patented June 22, 1976.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Building, Bethesda, Md. 20014

Patent 3,987,281. Method of Radiation Therapy Treatment Planning. Filed July 29, 1974. Patented Oct. 19, 1976.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW.
Washington, D.C. 20240

Patent 3,991,367. Detection of Potential on High-Voltage Transmission Lines. Filed Jan. 20, 1976. Patented Nov. 9, 1976.

Patent 3,991,419. Receiver System for Locating Transmitters. Filed Jan. 26, 1976. Patented Nov. 9, 1976.

Patent 3,933,138. Fire Prevention System. Filed Apr. 24, 1975. Patented Nov. 23, 1976.

Patent 3,994,390. Intermediate Drive for Belt Conveyor With Center Vertebrae. Filed Nov. 18, 1975. Patented Nov. 30, 1976.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 3,999,433. Mechanically Tuned Buffer Rod for Ultrasonic Temperature Sensor. Filed Oct. 23, 1974. Patented Dec. 28, 1976.

Patent 3,999,482. High Explosive Launcher System. Filed July 9, 1975. Patented Dec. 28, 1976.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch General Service Division, Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent 3,993,794. Method for Texturizing Proteins. Filed Jan. 15, 1976. Patented Nov. 23, 1976.

Patent 3,998,620. Method for Controlled Release of Fluoroketones. Filed Apr. 9, 1970. Patented Dec. 21, 1976.

Patent 4,002,774. Method for Removing Seeds From Papayas. Filed Aug. 20, 1975. Patented Jan. 11, 1977.

Patent 4,007,006. Modification of Wool. Filed Sept. 4, 1975. Patented Feb. 8, 1977.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St. SW, Washington, D.C. 20590

Patent 3,969,725. Distance Measuring Equipment. Filed June 12, 1974. Patented July 13, 1976.

Patent 3,969,730. Cross Slot Omnidirectional Antenna. Filed Feb. 12, 1975. Patented July 13, 1976.

Patent 4,006,078. Preparation of Soluble Edible Protein From Leafy Green Crops. Filed Apr. 11, 1975. Patented Feb. 1, 1977.

Patent 4,006,932. Inflatable Drag Reducer for Land Vehicles. Filed July 21, 1975. Patented Feb. 8, 1977.

Patent 4,010,357. Analog Visibility Computer. Filed Dec. 8, 1975. Patented Mar. 1, 1977.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patent
Washington, D.C. 20545

Patent 3,951,739. Positioning and Locking Device for Fuel Pin to Grid Attachment. Filed July 15, 1974. Patented Apr. 20, 1976.

Patent 3,956,063. Emergency Core Cooling System for a Fast Reactor. Filed May 24, 1973. Patented May 11, 1976.

Patent 3,957,575. Mechanical Design of a Light Water Breeder Reactor. Filed Apr. 16, 1974. Patented May 18, 1976.

Patent 3,960,655. Nuclear Reactor for Breeding U^{233}. Filed July 9, 1974. Patented June 1, 1976.

Patent 3,960,994. Preparation of High Temperature Gas-Cooled Reactor Fuel Element. Filed Nov. 26, 1974. Patented June 1, 1976.

Patent 3,964,964. Identification of Failed Fuel Element. Filed Oct. 15, 1974. Patented June 22, 1976.

Patent 3,964,966. Molten Core Retention Assembly. Filed Aug. 25, 1975. Patented June 22, 1976.

Patent 3,964,969. Internal Core Tightener. Filed June 20, 1974. Patented June 22, 1976.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 3,904,871. Target Locating Circuit Using a Lateral Photoelectric Diode. Filed Jul' 5, 1974. Patented Sept. 9, 1975.

Patent 3,913,060. Thermooptic Sonar System. Filed Mar. 4, 1974. Patented Oct. 14, 1975.

Patent 3,915,219. Metal Forming Apparatus for Producing Metal Ribbon Fibers. Filed May 1, 1974. Patented Oct. 28, 1975.

Patent 3,922,034. Armored Headrest. Filed Apr. 9, 1975. Patented Nov. 25, 1975.

Patent 3,934,234. Photodichroic Readout Device Using Circularly Polarized Light. Filed July 5, 1974. Patented Jan. 20, 1976.

Patent 3,970,669. Low Power Driver. Filed Mar. 3, 1975. Patented July 20, 1976.

Patent 3,979,089. Vertical Sensing and Control System. Filed Sept. 22, 1975. Patented Sept. 7, 1976.

Patent 3,981,239. Fluidic Link Master/Slave Fuze System. Filed Sept. 4, 1975. Patented Sept. 21, 1976.

Patent 3,987,280. Digital-to-Bandpass Converter. Filed May 21, 1975. Patented Oct. 19, 1976.

Patent 3,987,292. Discrete Fourier Transform Via Cross Correlation Charge Transfer Device. Filed June 2, 1975. Patented Oct. 19, 1976.

Patent 3,990,035. Housing Configuration for High Resolution Sonar. Filed Sept. 5, 1975. Patented Nov. 2, 1976.

Patent 3,990,401. Marine Mammal Vacuum Recovery System. Filed Mar. 31, 1975. Patented Nov. 9, 1976.

Patent 3,991,486. Aircraft Landing Signal Officer Trainer. Filed Nov. 7, 1975. Patented Nov. 16, 1976.

Patent 3,992,573. Stereoscopic Viewer Power Supply. Filed Nov. 19, 1975. Patented Nov. 16, 1976.

Patent 3,999,174. Discontinuous Chromium Film for Memory Element. Filed Sept. 19, 1975. Patented Dec. 21, 1976.

Patent 4,000,471. TWT Grid Circuit Utilizing Feedback. Filed Oct. 14, 1975. Patented Dec. 28, 1976.

Patent 4,000,525. Ceramic Prosthetic Implant Suitable for a Knee Joint Plateau. Filed Aug. 21, 1975. Patented Jan. 4, 1977.

Patent 4,001,861. Double-Layer, Polysilicon, Two-Phase, Charge Coupled Device. Filed Oct. 12, 1973. Patented Jan. 4, 1977.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 3,998,050. Reverse Flow Aft Inlet Ramjet System. Filed Mar. 11, 1975. Patented Dec. 21, 1976.

Patent 3,998,386. Oscillating Liquid Nozzle. Filed Feb. 23, 1976. Patented Dec. 21, 1976.

Patent 3,999,281. Method for Fabricating a Gridded Schottky Barrier Field Effect Transistor. Filed Jan. 16, 1976. Patented Dec. 28, 1976.

Patent 4,000,024. Burning Rate Modifiers for Solid Propellants. Filed Oct. 17, 1975. Patented Dec. 28, 1976.

Patent 4,000,366. Adaptive Gray Scale Control Circuit for Television Video Signals. Filed Mar. 25, 1975. Patented Dec. 28, 1976.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,953,556. Method for Preparing Uranium Nitride of Uranium Carbonitride Bodies. Filed May 17, 1974. Patented Apr. 27, 1976.

Patent 3,955,753. Gas Centrifuge With Driving Motor. Filed Apr. 13, 1961. Patented May 11, 1976.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW.
Washington, D.C. 20240

Patent 3,985,555. Decomposition of Chalcopyrite. Filed Jan. 23, 1975. Patented Oct. 12, 1976.

Patent 3,985,556. Reduction of Laterite Ores. Filed Mar. 22, 1976. Patented Oct. 12, 1976.

Patent 3,985,855. Recovering Copper Values From Oxidized Ores. Filed May 9, 1975. Patented Oct. 12, 1976.

Patent 3,986,401. Composite Sampling Method and System. Filed Oct. 14, 1975. Patented Oct. 19, 1976.

Patent 3,987,667. Self-Contained Instrument for Measuring Subterranean Tunnel Wall Deflection. Filed June 9, 1975. Patented Oct. 26, 1976.

Patent 3,988,240. Alternating Field Magnetic Separator. Filed Apr. 5, 1973. Patented Oct. 26, 1976.

Patent 3,993,455. Removal of Mineral Matter Including Pyrite From Coal. Filed June 25, 1973. Patented Nov. 23, 1976.

Patent 3,996,332. Synthesis of Rutile From Titaniferous Slags. Filed Dec. 2, 1975. Patented Dec. 7, 1976.

Patent 3,997,332. Steelmaking by the Electroslag Process Using Prereduced Iron or Pellets. Filed Jan. 8, 1976. Patented Dec. 14, 1976.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 3,906,496. Signal Processor System. Filed Jan. 10, 1974. Patented Sept. 16, 1975.

Patent 3,929,508. Reserve Battery. Filed Mar. 15, 1974. Patented Dec. 30, 1975.

Patent 3,944,117. Rollonet Assembly. Filed Apr. 18, 1975. Patented Mar. 16, 1976.

Patent 3,965,417. Coherent Component Magnitude Detector. Filed June 26, 1975. Patented June 22, 1976.

Patent 3,981,449. Exhaust Cooling System. Filed Jan. 29, 1968. Patented Sept. 21, 1976.

Patent 3,983,892. Explosive Valve. Filed Dec. 6, 1974. Patented Oct. 5, 1976.

Patent 3,986,910. Composite Propellants Containing Critical Pressure Increasing Additives. Filed Apr. 12, 1974. Patented Oct. 19, 1976.

Patent 3,990,034. Towable VLF Sonar Projector. Filed Apr. 23, 1975. Patented Nov. 2, 1976.

Patent 3,992,123. Pipe End Machining Apparatus. Filed Oct. 1, 1975. Patented Nov. 16, 1976.

Patent 3,996,422. Multiple Channel Decommutator Accumulator. Filed Oct. 22, 1975. Patented Dec. 7, 1976.

Patent 4,000,025. Incorporating Ballistic Modifiers in Slurry Cast Double Base Containing Compositions. Filed May 28, 1974. Patented Dec. 28, 1976.

Patent 4,005,424. Simulator for Doppler Radar Returns From Precipitation. Filed Oct. 24, 1975. Patented Jan. 25, 1977.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent 3,995,324. Actuator Device for Artificial Leg. Patented Dec. 7, 1976.

Patent 3,995,522. Precision Alinement Apparatus for Cutting a Workpiece. Patented Dec. 7, 1976.

Patent 3,995,621. Liquid Cooled Brassiere and Method of Diagnosing Malignant Tumors Therewith. Patented Dec. 7, 1976.

Patent 3,995,960. Method and Apparatus for Background Signal Reduction in Opto-Acoustic Absorption Measurement. Patented Dec. 7, 1976.

Patent 3,996,067. Silicon Nitride Coated, Plastic Covered Solar Cell. Patented Dec. 7, 1976.

Patent 3,996,070. Thermocouple Installation. Patented Dec. 7, 1976.

Patent 3,996,455. Two-Dimensional Radiant Energy Array Computers and Computing Devices. Patented Dec. 7, 1976.

Patent 3,996,462. Solid-State Current Transformer. Patented Dec. 7, 1976.

Patent 3,996,464. Mass Spectrometer With Magnetic Pole Pieces Providing the Magnetic Fields for Both the Magnetic Sector and an Ion-Type Vacuum Pump. Patented Dec. 7, 1976.

Patent 3,996,468. Electron Microscope Aperture System. Patented Dec. 7, 1976.

Patent 3,996,471. Method and System for in Vivo Measurement of Bone Tissue Using a Two Level Energy Source. Patented Dec. 7, 1976.

Patent 3,996,506. Inrush Current Limiter. Patented Dec. 7, 1976.

Patent 3,996,532. Phase Modulating With Odd and Even Finite Power Series of a Modulating Signal. Patented Dec. 7, 1976.

Patent 3,997,848. Linear Phase Demodulator Including a Phase Locked Loop With Auxiliary Feedback Loop. Patented Dec. 14, 1976.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 18, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-19-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-29-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas: Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-16-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-17-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-22-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-1-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-16-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange: Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during November 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,007,169 to 3,001,168, inclusive
Plant Patents..... Numbers 2,101 to 2,107, inclusive

REISSUES

DECEMBER 19, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,861
STITCH PRESSER FOR KNITTING MACHINE

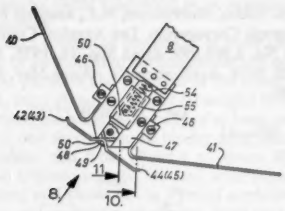
Robert Dietschy, and Georges Hexel, both of Couvet, Switzerland, assignors to Edouard Dubied et Cie, Neuchatel, Switzerland

Original No. 4,027,504, dated Jun. 7, 1977, Ser. No. 704,171, Jul. 12, 1976. Application for reissue Sep. 12, 1977, Ser. No. 832,495

Claims priority, application Switzerland, Nov. 25, 1975, 15251/75

Int. Cl.[2] D04B *7/04*

U.S. Cl. 66—64 **10 Claims**



1. An improved stitch presser for a knitting machine equipped with the following:

at least two needle beds arranged in an inverted V-shape;

needles capable of intersecting during their upward movement;

a carriage movable above the needle beds;

a system for control of the needles during their displacement in alternate directions;

a stitch presser which acts between the two needle beds on the stitches held by the needles; and

means for alternate control of the stitch presser in a position adequate for the movement of said stitch presser along a row of needles and in another position adequate for the movement in the opposite direction;

wherein the stitch presser comprises a slide thread for pressing the knitwear and a supplementary means for pressing the stitches against the needle beds, the field of action of the supplementary means being at least partially superimposed over the field of action of the slide thread and whose field of action starts ahead of the first point of crossing of the needles, seen in the moving direction of the carriage.

3. The stitch presser of claim **1** wherein the supplementary means is a nozzle through which a fluid is ejected to press the stitches against the needle beds.

4. The stitch presser of claim **3** wherein the nozzle ejects the fluid in a direction which is not perpendicular to the movement of the carriage.

Re. 29,862
IGNITION SYSTEM DEPENDENT UPON ENGINE SPEED

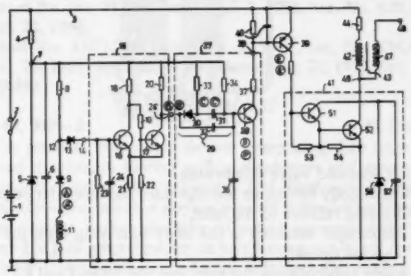
Herman Roozenbeek, Schwieberdingen; Bernd Bodig, Leinfelden; Klaus Meyer, Daverden, and Adolf Fritz, Suttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Original No. 3,881,458, dated May 6, 1975, Ser. No. 396,517, Sep. 12, 1973. Application for reissue May 5, 1977, Ser. No. 793,953

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1972, 2244781

Int. Cl.[2] F02P *1/00, 5/06*

U.S. Cl. 123—148 E **28 Claims**



1. In the ignition system of an internal combustion engine comprised of at least one electrical igniting element operative for producing an ignition spark once per ignition cycle, in combination, an ignition transformer having a secondary winding connected across said igniting element and having a primary winding; means for establishing a flow of current through said primary winding and including electronic switch means in the current path of said primary winding operative for controlling the flow of current through said primary winding; crankshaft-synchronized triggering means operative for generating a train of crankshaft-synchronized triggering pulses; monostable control means connected to said electronic switch means and having a trigger input connected to said triggering means for receipt of said triggering pulses, and operative when triggered into the unstable state thereof for rendering and maintaining said switch means non-conductive for the duration of said unstable state, whereby to interrupt the flow of current through said primary winding and induce across said secondary winding a voltage surge causing said igniting element of produce an ignition spark, and operative upon reverting to the stable state thereof for rendering and maintaining said switch means conductive for the duration of said stable state, whereby to establish a build-up of current flow in said primary winding in preparation for the next interruption of current flow, said monostable control means including timing means operative with increasing engine speed within a predetermined range of engine speeds for automatically and progressively [increasing] *decreasing* the ratio of the duration of said unstable state to the duration of said ignition cycle, and wherein said timing means comprises energy-storing means, means for effecting a first change of stored energy of said energy-storing means during the intervals between said triggering pulses and thereby for time periods dependent upon engine speed, and means operative upon generation of a triggering pulse by said triggering means for causing said monostable control means to undergo a transition to said unstable state and initiating an opposite second change of stored energy of

said energy-storing means and maintaining said monostable control means in said unstable state [until the completion of] *during* said second change of stored energy.

Re. 29,863

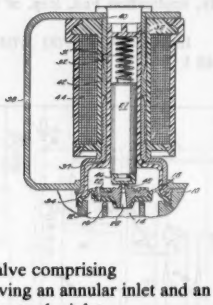
ANTI-CONTAMINANT DIAPHRAGM VALVE

James A. Kozel, Elmhurst, and Charles A. De Lew, Des Plaines, both of Ill., assignors to The Singer Company, New York, N.Y.

Original No. 3,872,878, dated Mar. 25, 1975, Ser. No. 425,266, Dec. 17, 1973. Application for reissue Oct. 26, 1976, Ser. No. 735,448

Int. Cl.[2] F16K *31/385*

U.S. Cl. 137—242 **5 Claims**



1. A solenoid valve comprising

a valve body having an annular inlet and an outlet centrally located relative to the inlet,

a diaphragm mounted in the body overlying both the inlet and the outlet,

a valve seat between the inlet and the outlet [and],

said diaphragm having a resilient face adapted to close on said seat,

a rigid insert molded in the diaphragm,

a central valve hole through the diaphragm and insert,

a solenoid assembly including a watertight plunger guide and a coil surrounding the guide,

the guide cooperating with the diaphragm to define a chamber the contents of which may flow through the vent hole when the hole is open,

a plunger slidable in the guide and having a valve portion normally closing the vent hole but movable upon energization of said coil to open the vent hole,

a bleed hole in said insert outside the portion overlying said valve seat,

a groove in said resilient face communicating with said bleed hole whereby fluid may flow from the inlet through the groove into the bleed hole and then into said chamber,

the width of said groove being less than the diameter of the bleed hole whereby entrained particles which pass through the groove will pass through the bleed hole while larger particles are rejected or lodge in the groove.

5. A solenoid valve comprising

a valve body having an annular inlet and an outlet centrally located relative to the inlet,

a valve seat between the inlet and the outlet,

a diaphragm mounted in the body overlying both the inlet and the outlet, said diaphragm having a substantially inflexible central portion of greater diameter than the valve seat surrounded by an annular flexible portion, the central portion having resilient face adapted to close on said seat,

a cental vent hole through the diaphragm,

a solenoid assembly including a watertight plunger guide and a coil surrounding the guide,

the guide cooperating with the diaphragm to define a chamber the contents of which may flow through the vent hole when the hole is open,

a plunger slidable in the guide and having a valve portion normally closing the vent hole but movable upon energization of said coil to open the vent hole,

a bleed hole in said central portion outside the portion overlying said valve seat,

a groove in said resilient face communicating with said bleed hole whereby fluid may flow from the inlet through the groove into the bleed hole and then into said chamber,

the width of said groove being less than the diameter of the bleed hole whereby entrained particles which pass through the groove will pass through the bleed hole while larger particles are rejected or lodge in the groove.

Re. 29,864

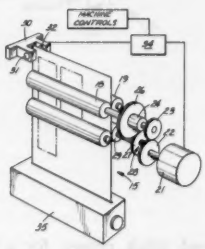
METHOD OF AND APPARATUS FOR MULTI-GALLEY COMPOSITION

Francis S. Szabo, Morristown, N.J., assignor to Addressograph-Multigraph Corporation, Los Angeles, Calif.

Original No. 3,905,699, dated Sep. 16, 1975, Ser. No. 482,849, Jun. 25, 1974. Application for reissue Mar. 17, 1976, Ser. No. 667,850

Int. Cl.[2] G03B *27/52*

U.S. Cl. 355—41 **9 Claims**



1. A method of multi-column composition, comprising the steps of:

providing a means for detecting a reference feature of a paper sheet advancing along a path and for producing a control signal from such reference feature when detected;

providing a power-driven paper feed means for advancing a photosensitive sheet along said path;

advancing a sheet along said path until the reference feature thereof is detected by said means, and a control signal is generated;

applying said signal to stop said power-driven paper feed means;

composing characters to produce at least one character in a first column position;

thereafter reversing said paper feed to withdraw the paper to a position retracted from said means for detecting the desired reference feature; and

re-advancing said sheet until another control signal is produced by said means for detecting the reference feature, and,

finally, composing a second at least one character on the same page in a lateral position to the first character and in a predetermined relationship thereto by a relationship to said reference feature;

whereby a multiple column galley is obtained in registration from a common reference.

Re. 29,865

CAST CEMENTED REFRACTORY METAL CARBIDES HAVING IMPROVED SINTERED DENSITY

James Q. Steigelman, Athens; Joseph J. Cleveland, Dushore; Richard N. Kleiner, Towanda, all of Pa., and Frank Rymas, St. Clair Shores, Mich., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Original No. 4,003,716, dated Jan. 18, 1977, Ser. No. 488,727, Jul. 15, 1974. Application for reissue Dec. 14, 1977, Ser. No. 860,395

Int. Cl.[2] B22F *3/00;* C22C *29/00*

U.S. Cl. 75—240 13 Claims

1. A cemented refractory metal carbide article consisting essentially of from about 75 to 97 weight % of discrete particles of at least one refractory metal carbide distributed in a matrix of from about 3 to about 25 weight % of a lower melting binder metal, said article having a predetermined configuration including at least a portion having a thickness of from about 0.004 inch to about 0.08 inch defined by at least 2 uneroded formed surfaces, characterized in that said article exhibits A-type, B-type and C-type porosities in accordance with ASTM specification #B-276-54 of up to and including A_3, B_3 and C_3.

8. A process for producing a flexible self-supporting article containing discrete particles of a refractory metal carbide, and a lower melting binder metal suspended in an organic portion, the process comprising:

(a) forming a slurry consisting essentially of from about 60 to 94 weight % of an inorganic portion consisting essentially of the carbide particles and particles of the lower melting binder metal, from about 2 to about 10 weight % of a solid organic portion consisting essentially of at least one plasticizer, at least one thermoplastic binder resin and at least one deflocculant, and from about 4 to about 30 weight percent of an organic solvent for said solid organic portion, (b) casting said slurry in the form of a relatively thin sheet, and (c) evaporating said solvent from said mixture to thereby form a flexible self-supporting article, characterized in that said organic portion upon heating to a temperature up to about 1000° is substantially completely removed from the article.

Re. 29,866

DOUBLE HETEROSTRUCTURE STRIPE GEOMETRY SEMICONDUCTOR LASER DEVICE

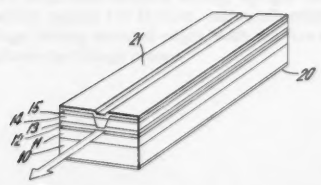
Hiroo Yonezu, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Original No. 3,993,964, dated Nov. 23, 1976, Ser. No. 605,550, Aug. 18, 1975. Division of Ser. No. 492,262, Jul. 26, 1974, which is a continuation of Ser. No. 413,923, Nov. 8, 1973, abandoned, which is a continuation of Ser. No. 267,068, Jun. 28, 1972, abandoned. Application for reissue Feb. 14, 1978, Ser. No. 878,187

Claims priority, application Japan, Jul. 30, 1971, 46-57665

Int. Cl.[2] H01S *3/19*

U.S. Cl. 331—94.5 H 1 Claim



1. A GaAs-$Al_xGa_{1-x}As$ double heterostructure injection laser comprising an N-type GaAs substrate, a first layer made of N-type $Al_xGa_{1-x}As$ epitaxially grown on one major surface of said substrate, a second layer made of GaAs epitaxially grown on said first layer, a third layer made of P-type $Al_2Ga_{1-x}As$ epitaxially grown on said second layer, a fourth layer made of N-type GaAs epitaxially grown on said third layer, a silicon dioxide film formed on said fourth layer and having a stripe-shaped opening formed therein, and a thin elongated P-type region formed on the surface of said [forth] *fourth* layer through the selective diffusion of P-type impurities through said stripe-shaped opening and into said fourth layer and extending past the junction between said third and fourth layers and into a portion of said third layer, a first electrode covering said silicon dioxide film and said [elongaged] *elongated* region, and a second electrode in ohmic contact with the other major surface of said substrate; wherein excitation current supplied through said first electrode is allowed to flow substantially only through the deepest portion of said thin elongated p-type region as the result of a reverse bias developed between said third and fourth layers.

Re. 29,867

PRESSURE SENSITIVE DIAPHRAGMS WITH STRESS NULL ZONE ORIENTED BRIDGE PATTERNS

Cecil K. Stedman, New Denver, Canada, assignor to Gould, Incorporated, Rolling Meadows, Ill.

Reissued No. Re. 25,924, dated Dec. 7, 1965, Ser. No. 420,470, Oct. 22, 1964.

Original No. 3,071,745, dated Jan. 1, 1963, Ser. No. 134,070, Aug. 25, 1961. Application for reissue Mar. 21, 1977, Ser. No. 779,893

Int. Cl.[2] G01L *1/22*

U.S. Cl. 338—2 51 Claims

1. A pressure responsive device comprising [an edge restrained diaphragm having an] *a diaphragm and means restraining the edge of said diaphragm, said diaphragm having an electrically non-conductive surface to which is bonded an* integral bridge pattern with a plurality of active segments interconnected [at] *by* juncture areas in turn having *connected thereto* relatively low resistance conductor segments [extending beyond the restrained edge of the diaphragm]; said juncture areas lying substantially in the radial stress null zone of the diaphragm, with one active segment connected to each juncture area disposed near-center from said radial stress null zone *of said diaphragm* and the other active segment connected thereto disposed near-edge from said radial *stress* null zone *of near diaphragm.*

Re. 29,868

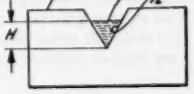
FLUID FLOW MEASURING SYSTEM AND METHOD

James G. Schontzler; Wendall C. Gates, both of Santa Cruz, and Victor L. Dagragnano, Redwood City, all of Calif., assignors to Manning Environmental Corporation, Santa Cruz, Calif.

Original No. 3,866,028, dated Feb. 11, 1975, Ser. No. 383,269, Jul. 27, 1973. Application for reissue Dec. 15, 1975, Ser. No. 640,411

Int. Cl.[2] G01F *1/00;* G06G *9/00*

U.S. Cl. 364—510 21 Claims



1. A total flow measuring system for liquid flow through a channel having a predetermined cross section shape comprising, means for detecting a fluid surface level in the channel, *first* means *coupled to said means for detecting* for providing a signal related to fluid surface level relative to a predetermined reference level *second means coupled to said means for detecting for visually indicating existing surface height,* computer means for receiving said signal related to surface level and converting said signal to a digital signal, and program means for receiving said digital signal and providing output indicative of total flow volume.

PLANT PATENTS

GRANTED DECEMBER 19, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,348

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Isselburg, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,052

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Louisiana and characterized by the combined features of light pink, single, non-dropping flowers having frilled edges and carried on upright and relatively short stems, with the flowers appearing just above the rosette of dark green leaves; and by its compact habit and excellent growth characteristics.

4,349

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Isselburg, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,053

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the varietal name Kansas and characterized by the combined features of strong upright flower stems each of which carries 4–5 flowers; large, star-shaped, non-dropping flowers pure white in color, with red hue in center; continuous flowering, and fast growing and compact growth habit.

4,350

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Issellburg, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,054

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Maine and characterized by the combined characteristics of large, single star-shaped flowers white in color, with violet-blue centers; strong, upright flower stems each of which carries 4–5 flowers, and small, relatively light green foliage having serrated edges, with the flowers appearing just above the foliage crown.

4,351

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Isselburg, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,211

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Montana and characterized by the combined features of white flowers, having blue centers, the flowers being carried on strong, upright flower stems; fast growing and compact growing habit, with initial flowering being on 5–7 stems 7–8 weeks after potting, and oblong leaves having smooth edges and hairy and velvety texture.

4,352

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Isselburg, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,328

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Kentucky and having the combined characteristics of strong and upright stems each carrying up to 10 flowers; non-dropping, blue-violet and durable flowers regular in shape; dark green leaves, and sturdy growth habit.

4,353

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Isselburg, Fed. Rep. of Germany

Filed Feb. 22, 1978, Ser. No. 880,329

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Wisconsin and characterized by the combined features of intensive blue-violet flower color, with the flowers being long lasting and non-dropping; uniform flowering; vigorous and fast growing growth habit, producing up to 11 or more flower stems, each carrying four to six flowers, thereby providing a full bouquet when the plant is in full bloom, and soft and velvety leaves, medium to light green in color.

PATENTS

GRANTED DEC. 19, 1978

ERRATA

For CLASS	See PATENT NO.
405–070	4,129,989
405–299	4,129,990
405–150	4,129,991
405–164	4,129,992
297–046	4,130,316
355–026	4,130,354
422–031	4,130,393
422–168	4,130,397
528–092	4,130,511
521–031	4,130,512
521–107	4,130,513
528–326	4,130,521
528–125	4,130,543
528–215	4,130,544
528–073	4,130,546
528–197	4,130,548
528–093	4,130,549
528–481	4,130,551
528–285	4,130,552
544–302	4,130,560
546–204	4,130,561
562–448	4,130,582
568–645	4,130,591
568–604	4,130,592
528–305	4,130,719

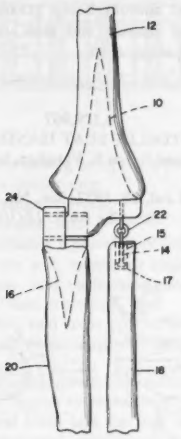
PATENTS

GRANTED DECEMBER 19, 1978

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

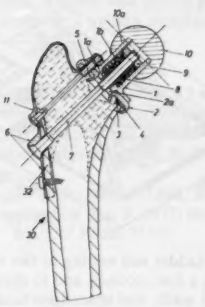
4,129,902
ELBOW PROSTHESIS
Stanley D. Harmon, 10511 Royal Oak Rd., Oakland, Calif. 94605
Filed Jul. 11, 1977, Ser. No. 814,362
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **4 Claims**



1. An elbow prosthesis comprising:
(a) a humeral implant having a radial and an ulnar segment at one end contiguous to each other, said ulnar segment having a shaft extending medially;
(b) a radial implant;
(c) an ulnar implant having a bearing surface which interlocks with said shaft of said humeral implant to form a shaft and bearing joint; and
(d) a three-link chain which connects said radial segment of said humeral implant with said radial implant.

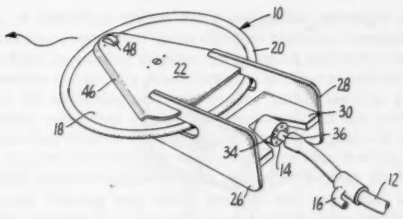
4,129,903
HINGE PROSTHETIC JOINT WITH BALL HEAD
Arnold H. Huggler, Steigstrasse 181a, Maienfeld, Switzerland
Filed May 31, 1977, Ser. No. 802,144
Claims priority, application Switzerland, Jun. 3, 1976, 7065/76
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.913 **13 Claims**

1. A hinge prosthetic joint for a bone, especially a proximal femur-endoprosthetic joint, comprising:
a ball;
a tension device for anchoring the ball at an end of the bone where the prosthetic joint is implanted, said tension device comprising a tension rod insertable through the bone, a pressure disc which can be placed upon the bone at the side of the ball, and a counter plate which can be placed at the opposite side of the bone;
a substantially sleeve-shaped hollow pin for mounting the ball at the pressure disc, said tension rod extending into the hollow interior of said sleeve-shaped pin; and



a nut member for threadably connecting said tension rod within said sleeve-shaped pin.

4,129,904
SWIMMING POOL CLEANER
Andrew L. Pansini, 200 Golden Gate Ave., Belvedere, Calif. 94920
Filed Nov. 14, 1977, Ser. No. 851,441
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 4—172 **8 Claims**



1. In a swimming pool cleaner, a carrier and means associated therewith operable to drive said carrier in a submerged condition above the bottom of a pool, said carrier comprising a wheel member, a wheel carrier and wheel fender member disposed in closely adjacent and overlying relation to said wheel member inwardly of the periphery thereof, said carrier and fender member having a leading end and a trailing end, said wheel member being attached to said carrier and fender member for substantially free rotational movement relative thereto, a guidance roller element carried at the leading end of said carrier and fender member, and guidance fin means attached to the trailing end of said carrier and fender member.

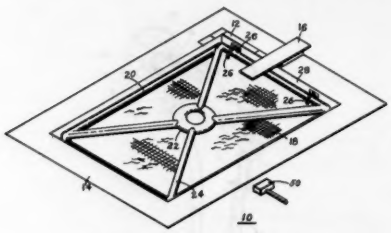
4,129,905
SWIMMING POOL RESCUE NET
Jerzy Niemirow, Riverside, N.J. 08075
Filed Jun. 30, 1977, Ser. No. 811,546
Int. Cl.[2] E04H *3/19*
U.S. Cl. 4—172.13 **4 Claims**

1. Swimming pool rescue apparatus which is completely submerged in its inoperable position and comprising:
an inflatable bladder including an inflatable peripheral portion which mates the configuration of the pool walls and a substantially centrally disposed inflatable hub portion,

said peripheral and hub portions having a plurality of inflatable ribs communicating there between,

a netting generally coextensive with said peripheral portions and firmly secured to said bladder,

a supply means including a supply hose of approximately the same size and material of said ribs and connected to said peripheral portion for rapidly inflating said bladder to



cause said bladder and netting to rise to water's surface in said pool in a few seconds, and to mate the configuration of said pool walls, and spaced vertical guide rods having curved top ends which are secured to said pool wall at said curved ends and spaced therefrom at a deep end of said pool to guide the vertical movement of said peripheral portions of said bladder between said guide rods.

4,129,906

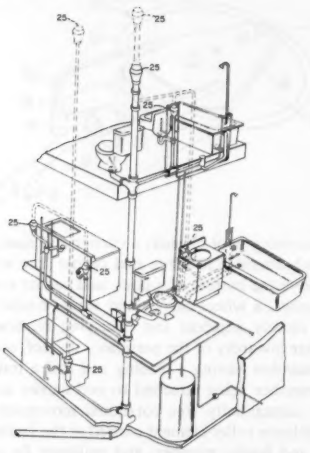
NORMALLY CLOSED SEWAGE VENTING SYSTEM

Jack G. Ohringer, 1435 Dolores St., San Francisco, Calif. 94110

Filed Nov. 28, 1973, Ser. No. 419,559

Int. Cl.[2] E03D *9/04*

U.S. Cl. 4—211 **4 Claims**



1. A normally closed sewage venting system for operation in a surrounding open environment having an atmosphere comprising:

(a) a closed environment;

(b) a sewer main;

(c) at least one plumbing fixture located in said closed environment, said closed environment being surrounded by said surrounding open environment and said atmosphere;

(d) a drain line, connecting means for operatively connecting said drain line between said plumbing fixture and said sewer main;

(e) a trap positioned within said drain line;

(f) a two way breather valve having first and second ends, first means for operatively connecting said first end of said breather valve to said drain line downstream of said trap and to said sewer main, said second end of said breather valve in communication with said atmosphere of said open surrounding environment;

(g) said sewer main and drain line for conducting and containing solids, liquids and gases; and

(h) said breather valve including breather means for permitting the escape of said gases to atmosphere when the pressure of said gases exceeds the pressure of said atmosphere by a first predetermined amount and permitting said atmosphere to enter said drain line and sewer main when the pressure of said atmosphere exceeds the pressure of said gases by a second predetermined amount, said first predetermined amount being greater than said second predetermined amount and said second predetermined amount being about zero.

4,129,907

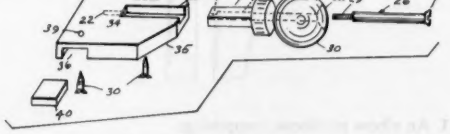
TOILET SEAT HANDLE

Paul R. Vaughan, and Susan E. Vaughan, both of 4646 Budd Dr., Erie, Pa. 16506

Filed Jul. 25, 1977, Ser. No. 818,405

Int. Cl.[2] A47L *13/10*

U.S. Cl. 4—251 **1 Claim**



1. In combination, a water closet having a seat and a handle assembly attached to one side of said seat for lifting said seat,

said handle assembly comprising,

a mounting plate having two flat sides, two edges and two ends,

a rectangular groove in one said flat side and extending through one end and two spaced rectangular notches in the side of said plate opposite said groove,

said groove and said notches each extending approximately half-way through said mounting plate,

spaced countersunk holes in said mounting plate extending from the bottom of each said notch through said plate,

one end of each said hole terminating at said notches in a countersunk hole,

a flat-head screw in each said hole attaching said mounting plate to said seat,

a rectangular block fitted into each said notch,

an arm received in said groove between said mounting plate and said seat,

a counterbored hole in said arm,

said arm terminating at the end remote from said mounting plate in a cylindrical member,

a spherical member,

said spherical member having a bore therethrough,

one end of said bore in said spherical member being countersunk,

a pin extending through said bore in said spherical member, through said counterbored hole in said arm and having a threaded end engaging a threaded hole in said mounting plate,

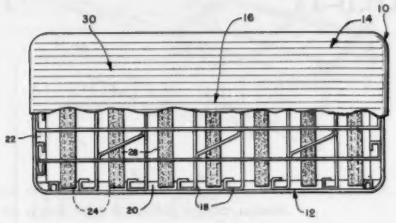
said pin having a shoulder adjacent said threaded end engaging a shoulder on said arm holding said arm to said mounting plate in fixed position.

4,129,908

FOUNDATION UNIT WITH CUSHIONED CROSS RAILS

Robert F. Wagner, Lombard, Ill., assignor to Sealy, Inc., Chicago, Ill.

Filed Nov. 7, 1977, Ser. No. 849,170
Int. Cl.[2] A47C *23/04*
U.S. Cl. 5—35 16 Claims



1. A foundation unit having an upper surface for supporting a mattress or the like comprising:

a substantially rectangular frame;

a resilient border region; and

a center region including a plurality of cross rails extending transversely of the unit, means for cushioning a plurality of said cross rails, said cushioning means overlying the upper surface of said cross rails, and

means for supporting said cross rails so that said cushioning means substantially immediately underlies said upper surface of the unit,

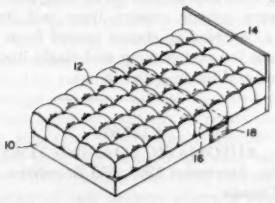
wherein the cushioning means has sufficient resiliency to allow the center region to be resiliently functional when subject to normal loads and the unit does not have any member overlying said cushioning means of sufficient rigidity and dimensions to substantially obstruct said functional resiliency of the center region.

4,129,909

BED STORAGE ARTICLE

Angela Riehl, 3420 Avenue J., Brooklyn, N.Y. 11210

Continuation-in-part of Ser. No. 687,704, May 19, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,362
Int. Cl.[2] A47C *11/00*
U.S. Cl. 5—317 R 3 Claims



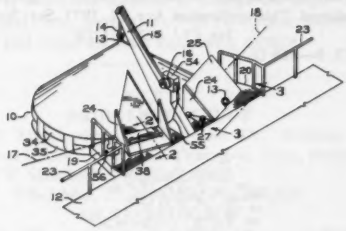
1. A bedding storage article for use with a mattress and a mattress supporting member of a bed, comprising an elongated rectangular fabric-like sheet, said sheet having a length at least as great as the width of said mattress, said sheet having a width less than the length of said mattress, said sheet including a pair of portions adjacent the ends thereof, said pair of portions extending outwardly and downwardly from a lowermost lateral surface of said mattress when said mattress is disposed juxtaposed resting on an equisized supporting member and when the remaining portion of said sheet is disposed residing on an uppermost lateral surface of said mattress supporting member, a first portion of each of said pair of portions being disposed having a U-shaped cross section, a second portion of each of said pair of portions contiguous with and extending adjacent to one free end of one leg of said U-shaped cross section, the free end of said second portion being disposed intermediate the legs of said U-shaped cross section, means to secure said first portion and said second portion of said each of said pair of portions adjacent the marginal edges thereof defining a pocket having said free end of said second portion forming an entranceway into an interior pocket, said pocket having an open mouth portion, said open mouth portion being disposed intermediate said remaining portion and said legs of said U-shaped cross-section, wherein said pair of portions and said remaining portion comprise a unitary structure.

4,129,910

LAUNCHING SYSTEM FOR INFLATABLE RAFT

David V. Edwards, Goring-by-Sea, Worthington, England; Harvey B. Lesh, Jr., N. Canton, and Ronald W. Phillips, II, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 777,501, Mar. 14, 1977, abandoned. This application Sep. 8, 1977, Ser. No. 831,585
Int. Cl.[2] B63B *23/00*
U.S. Cl. 9—42 14 Claims



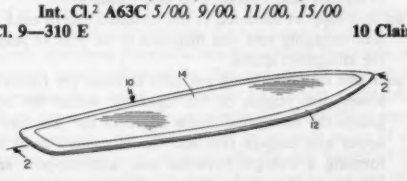
1. A launching system for a collapsible passenger escape conveyance supported on an elevated platform comprising an overhead supporting member, an apron on said conveyance, a releasable connecting means between said apron and said platform for stabilizing said conveyance during loading, a cable member connected to said conveyance and to said overhead supporting member for supporting said conveyance in a loading position and lowering said conveyance after loading, cable control means engageable with said cable member for lowering and braking said cable member and sequential release means operatively connected to said cable control means and to said connecting means between said apron and said platform, said sequential release means being inoperative to release the brake of said cable control means until said apron is disconnected from said platform to avoid tilting of said conveyance during lowering from the loading position.

4,129,911

SOFT DECK SURFBOARD

Michael D. McDonald, 960 Scott St., and Stanley A. Pleskunas, 3725 Pio Pico St., both of San Diego, Calif. 92106

Filed Feb. 22, 1977, Ser. No. 770,438
Int. Cl.[2] A63C *5/00, 9/00, 11/00, 15/00*
U.S. Cl. 9—310 E 10 Claims



1. A soft deck surfboard comprising:

(a) a lower body including:

(i) a core having a general outward surfboard configuration defining an upper surface, a bottom surface and a pair of side rails; and

(ii) a smooth, hardened impervious shell covering at least the bottom surface and rails of said core to provide said surfboard with generally rigid control surfaces and low-drag characteristics in its water-contacting surfaces; and

(b) an upper body comprising a yielding, resilient foam pad secured to the top of said lower body and covering a substantial portion of same to define a soft, tractable deck to enhance the comfort and stability of a surfer using said surfboard in both the kneeling and standing mode; and

(c) the upper surface of said lower body being relieved to define a longitudinally extended cavity, and said upper body fitting within said cavity to define a deep yielding deck and is contoured to define a continuous, smooth transition to the contiguous cavity-defining portions of the upper surface of said lower body.

4,129,912

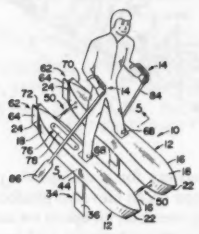
AQUATIC DEVICE

Walter L. Robinson, P.O. Box 642, Ft. Bragg, Fayetteville, N.C. 28302

Continuation-in-part of Ser. No. 461,637, Apr. 17, 1974, abandoned. This application Apr. 11, 1977, Ser. No. 786,069

Int. Cl.[2] A63C *15/04*

U.S. Cl. 9—310 D **14 Claims**



1. An aquatic device comprising in combination:

a pair of flotation means for supporting the legs of an operator on a liquid such as water;

each of said flotation means comprising an outer shell for receiving the feet of the operator;

flotation interconnection means including a coupling for interconnecting the pair of flotation means to control the separation between said flotation means;

said coupling means comprising a resilient coupling element;

a pair of paddles specifically configured for use in combination with the floats;

each of said paddles comprising an elongated substantially tubular shaft having a blade formed at one end of said shaft;

an upper arm engaging rest rigidly extending in substantially perpendicular relationship to the longitudinal axis of the elongated shaft and disposed at the opposite ends of the elongated shafts relative to said paddles;

an arm support mounted at the terminal end of each of said arm engaging rest and disposed to be remote relative to the elongated shafts;

said arm supports being partially circular for receiving the lower arm region of the operator while the operator grasps the elongated shafts adjacent the juncture of the upper arm engage rest and the elongated shaft thereby forming a triangle between said arm support and said tubular shaft and the lower arm region of the operator; and

said arm supports being removably mounted to said tubular shafts enabling said arm supports to be positioned to either contact the upper or lower side of the lower arm region of the operator.

4,129,913

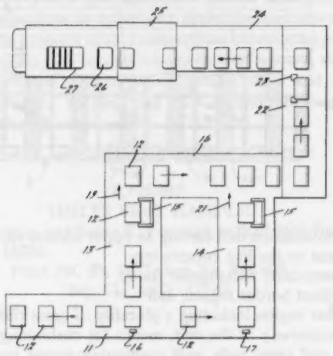
ARRANGEMENT FOR PERFORATING AND SPIRAL BINDING OF RELATIVELY THICK GROUPS OF SHEETS

Ernst Pfaffle, Neuffen, Germany, assignor to Hans Sickinger Co., Pontiac, Mich.

Filed Aug. 11, 1977, Ser. No. 823,633

Int. Cl.[2] B42C *19/08*

U.S. Cl. 11—1 A **2 Claims**



1. A perforating and coil binding system for relatively thick groups of sheets, comprising a first leg along which groups of sheets are moved with a predetermined spacing, first and second perforating station legs extending transversely from said first leg and spaced from each other along said first leg, means for shifting alternate groups from said first leg onto the first of said perforating station legs and the remaining groups onto said second perforating station leg, said two perforating station legs having means for perforating said groups, a receiving leg extending transversely past the exit ends of said two perforating station legs with said first perforating station leg being upstream of said second perforating station leg, means for alternately placing perforated groups from said first and second perforating station legs onto said receiving leg whereby the perforated groups form a single line, said lastmentioned means including means for feeding the perforated groups from said first perforating station leg, in spaced relation, onto said receiving leg and synchronized means for feeding the perforated groups from said second perforating station leg into the spaces between groups coming from said first perforating station leg, a coil binding station spaced from said receiving leg, and means for transporting said single line of perforated groups to said coil binding station.

4,129,914

AUTOMATIC LOADING TRAY

Gerhard Jahn, Apartment 1907, 655 Broadview Ave., Toronto, Ontario, Canada

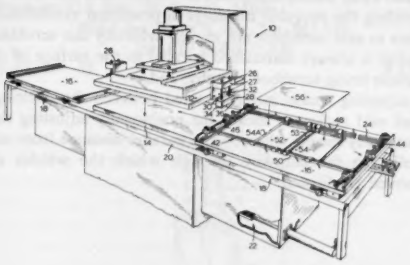
Filed Dec. 9, 1976, Ser. No. 749,928

Int. Cl.[2] B42C *15/00*

U.S. Cl. 11—2 **22 Claims**

1. Suitable for use in an Automatic Loading Tray, comprising a frame having lateral side rails and a pair of longitudinal cross-bar arrangements spaced from each other and secured to the lateral side rails for reciprocal movement therealong, each cross-bar arrangement including two laterally spaced substantially parallel bars, and inner and outer bar, said inner bar nearer said other cross-bar arrangement than said outer bar, and means to limit maximum separation between said two spaced bars, rotatable spacer means for positioning between said spaced bars, said rotatable means being of substantially uniform non-cicular or non-square cross-section, looking downwardly thereon for causing the bars to abut said means to limit their maximum separation when said rotatable means is

positioned between said bars in a first position and for causing said bar to loosely seat between said means to limit maximum

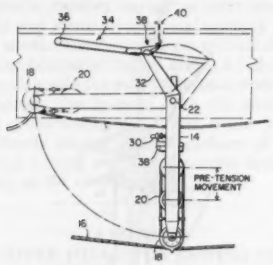


separtion when said rotatable means is in a second position, and means to rotate said rotatable spacer means.

4,129,915
CABLE TENSIONING MEANS FOR KING POST STRUCTURING

William R. Abell, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1978, Ser. No. 896,528
Int. Cl.[2] E01D *9/02*
U.S. Cl. 14—10 **2 Claims**



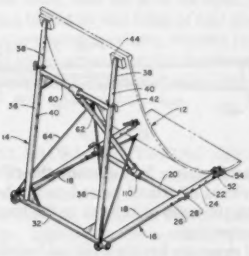
1. A bridge structure having at least one tensioning cable attached thereto at two longitudenally spaced points, at least one post pivoted to said bridge structure at a location between said spaced points, an end of said post spaced from the pivot connection to said bridge structure adapted to engage the cable; means associated with and attached to said bridge structure and said post for rotating said post about the pivot connection to said bridge structure into its operative position, said operative position being substantially perpendicular to the span of said bridge structure; sheave means associated with and attached to said post; said tensioning cable being threaded around said sheaves and means associated with said sheaves for causing separation of said sheaves whereby tension is introduced to said cable for reinforcing the bridge structure.

4,129,916
ADJUSTABLE SKATEBOARD RAMP

Todd R. Schlesinger, 147-½ Virginia Pl., Costa Mesa, Calif. 92627, and William L. Shaffer, 3235 Nebraska St., Costa Mesa, Calif. 92626

Filed Mar. 27, 1978, Ser. No. 890,454
Int. Cl.[2] E01D *1/00*
U.S. Cl. 14—69.5 **11 Claims**

10. In an adjustable, demountable ramp for use in conjunction with wheeled sporting devices, the combination of: an elongated resilient ramp member having its lower extremity juxtaposable to a supporting surface and its upper extremity disposable in spaced relationship with respect to said supporting surface; a suspensory frame for said ramp member, said suspensory frame including adjustment means to permit adjustment thereof and corresponding adjustment of said ramp member; and movable connections between said frame and said ramp member whereby said frame maintains said ramp mem-

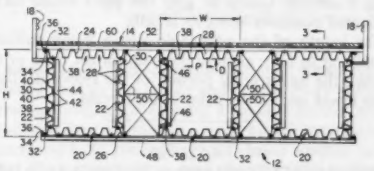


ber in a flexed, curvilinear position on said frame and whereby adjustment of said frame causes the elevation of the upper extremity of said ramp member to change the angle of incidence of said ramp member and its curvilinear aspect with respect to said frame and said supporting surface.

4,129,917
BRIDGE STRUCTURE

Eugene W. Sivachenko, 6471 Riverside Dr., Redding, Calif. 96001, and Firoze H. Broacha, Lakewood, Colo., assignors to Eugene W. Sivachenko, Redding, Calif.

Filed Mar. 27, 1978, Ser. No. 890,439
Int. Cl.[2] E01D *19/12*
U.S. Cl. 14—73 **53 Claims**



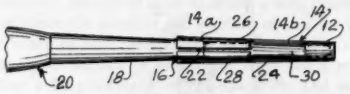
45. A long span bridge comprising in combination: a plurality of side-by-side, generally parallel box beams, the box beams having transverse dimensions at least one of which does not substantially exceed about 8 feet and being further defined by generally upright, spaced apart box beam sides and generally parallel, upper and lower chord plates, proximate edge portions of the sides and the chord plates being rigidly secured to each other, the sides and the chord plates being constructed of relatively thin walled corrugated plate made of a corrosion resisting material, corrugations of the plate having a generally trapezoidal cross-section and being arranged parallel to a longitudinal axis of the beams, the corrugations further having a pitch of at least about 16 inches and a depth of at least about 5 inches; means for rigidly securing the box beams to each other; a relatively thin shear plate attached to each box beam side, the shear plates being substantially flat and placed against the corresponding box beam sides so as to contact corrugation troughs of the side protruding towards the shear plate; means for rigidly securing the shear plates to at least some of the corrugation troughs over substantially the full height of the box beam sides to rigidify the shear plates and to prevent their buckling when subjected to vertically acting shear loads; a bridge deck constructed of corrugated plate carried by the box beams, the corrugations of the deck being oriented transversely to the corrugations of the chord plates; and a road bed placed on top of and carried by the bridge deck.

4,129,918

ADJUSTABLE SLEEVE FOR ARTISTS PAINT BRUSHES

Robert Lee, 41-12 29th St., Long Island City, N.Y. 11101

Filed Aug. 29, 1977, Ser. No. 828,894
Int. Cl.[2] A46B 9/10
U.S. Cl. 15—169 **5 Claims**



1. An adjustable sleeve for adjusting the effective length of the hairs or bristles of artists' paint brushes having a tapered ferrule securing the hairs or bristles to the handle, said adjustable sleeve comprising:

(a) a conical structure having a circumferentially continuous tubular tip and a longitudinally split body extending upwardly from said tip, coaxially therewith,

(b) said longitudinally split body defining a relatively narrow slit at its upper portion and a relatively wide cutout at its lower portion,

(c) said narrow slit merging into and being continuous with said wide cutout,

(d) said tubular tip having a circular cross section,

(e) said lower portion of the body having a C-shaped cross-section, and

(f) said upper portion of the body having a C-shaped cross-section,

(g) said adjustable sleeve being conically tapered from a relatively small diameter at its tubular tip to a relatively large diameter at its longitudinally slit upper body portion to conform to the taper of a paint brush ferrule,

(h) the upper body portion of said adjustable sleeve comprising a conical C-clip to grip the paint brush ferrule at selected positions along its length,

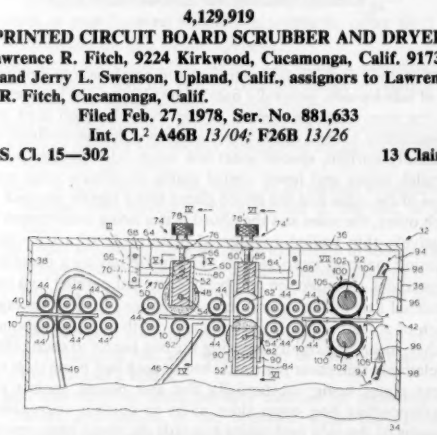
(i) the length of the adjustable sleeve being sufficient to enable it to fully enclose the paint brush hairs or bristles when the upper body portion of the sleeve is clipped to the lower end of the paint brush ferrule.

4,129,919

PRINTED CIRCUIT BOARD SCRUBBER AND DRYER

Lawrence R. Fitch, 9224 Kirkwood, Cucamonga, Calif. 91730, and Jerry L. Swenson, Upland, Calif., assignors to Lawrence R. Fitch, Cucamonga, Calif.

Filed Feb. 27, 1978, Ser. No. 881,633
Int. Cl.[2] A46B 13/04; F26B 13/26
U.S. Cl. 15—302 **13 Claims**



4. In scrubbing and drying apparatus having an enclosure containing a plurality of equally spaced driven rollers mounted thereto defining a pathway for moving a flat article therethrough and having a source of water directed on a surface of the article, a scrubbing roller mounted between a pair of movable members for scrubbing the surface of the article, a partial-drying assembly for removing a portion of the water on the article following the scrubbing thereof, and a source of drying air for drying the remaining water from the partially dried article, the improvement comprising:

(a) anti-sway means connected to the movable members for holding the movable members in positional synchronization as said members are moved whereby the scrubbing roller is always maintained parallel to the surface of the article being scrubbed thereby; and,

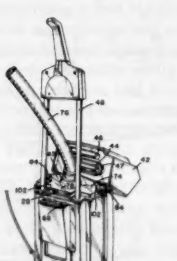
(b) adjusting means interconnected between the enclosure and said anti-sway means for positionally adjusting said anti-sway means whereby the parallel distance from said roller to the pathway through which the articles are moved is adjusted.

4,129,920

HOSE COUPLING FOR UPRIGHT VACUUM CLEANER

Robert A. Evans, and James W. Momberg, both of Stamford, Conn., assignors to Consolidated Foods Corporation, Old Greenwich, Conn.

Filed Dec. 12, 1977, Ser. No. 859,888
Int. Cl.[2] A47L 5/32
U.S. Cl. 15—337 **5 Claims**

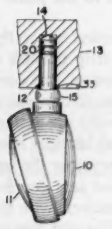


1. In a vacuum cleaner of the upright type, a base member, means for movably supporting said member on a substantially horizontal surface, an elongated enclosure pivotally secured to said base member, said enclosure having an upper end wall formed with an opening to the interior of the enclosure, a dust bag insertable into and removable from said enclosure through said opening, said bag having a stiff end member larger than said opening to thereby rest on the exterior of said wall and being formed with an inlet to the interior of said bag, a conduit within said enclosure having an upper end terminating in a second opening in said end wall, a cover hinged to one edge of said wall and formed with a passageway connecting said second opening to said inlet when the cover is closed, an adaptor, means for securing said adaptor to said end wall when said cover is open, said adaptor having a passage therethrough communicating with said inlet and a portion covering said second opening, and means for connecting a flexible suction hose to said adaptor and in communication with the outer end of said passage.

4,129,921
PLASTIC GRIP RING

Frederick C. Greene, St. Joseph, Mich., assignor to Shepherd Products U.S. Inc., St. Joseph, Mich.

Filed Jan. 5, 1978, Ser. No. 867,138
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—38 **6 Claims**

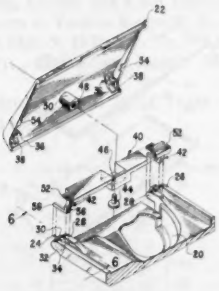


1. A non-metallic grip ring for a caster assembly including a caster stem and a caster mounting socket, said grip ring comprising an annular member mounted between said stem and said socket and having an outer bearing surface of some vertical extent located more closely adjacent to the bottom of the member than the top, said annular member having a tapered perimeter diminishing upwardly from a maximum diameter at said outer bearing surface to a minimum diameter at the top of the member, said outer bearing surface engaging the inner wall in said mounting socket, a cylindrical inner collar adjacent the top of said annular member having an inner bearing surface mounted about said stem, a cylindrical opening adjacent the bottom of the annular member of larger internal diameter than that of said inner bearing at the top collar, a bell-shaped internal surface merging with the internal surface of said cylindrical opening connecting the opening with the annular internal surface of said cylindrical bearing collar, and an interior notch extending vertically of said internal surfaces of the annular member defining a break area in the annular member to provide a split ring on the caster stem.

4,129,922
ARM TOP COVER HINGE FOR SEWING MACHINES

Joseph P. Law, Scotch Plains, and Alfred R. Mack, Bayonne, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Feb. 24, 1978, Ser. No. 880,736
Int. Cl.[2] E05D *11/10*
U.S. Cl. 16—139 **3 Claims**

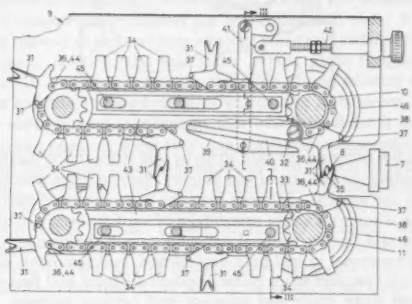


1. A hinge mechanism for a lid of a sewing machine arm top cover comprising a pair of pivot pins attached to said arm top cover and having a substantially vertical and a substantially horizontal surface formed thereon for defining an open and a closed position of said lid, as a lobe joining said surfaces at one end and an arcuate cylindrical surface joining said surfaces at a second end, a pair of concave saddles formed on said lid for rotatably engaging said arcuate cylindrical portion of said pivot pins, a spring means embracing said pivot pins and fastened to said lid, said spring means being so disposed to be unbiased by said horizontal surface of said pivot pins when said lid is in a closed position and unbiased by said vertical surface of said pivot pins when said lid is in an open position, said spring means being biased by said lobes of said pivot pins when said lid is in an intermediate position, thereby causing said lid to arcuately pivot to a position whereby the bias applied to said spring means by said lobes is relieved.

4,129,923
CONTINUAL SAUSAGE STUFFING APPARATUS

Cornel Hoegger, Flawil, Switzerland, assignor to C. Hoegger & Cie. AG., Gossau, Switzerland

Filed Nov. 23, 1977, Ser. No. 854,083
Claims priority, application Switzerland, Nov. 29, 1976, 15008/76
Int. Cl.[2] A22C *11/02, 11/10*
U.S. Cl. 17—33 **10 Claims**



1. In a sausage stuffing apparatus including means for pushing a sausage mixture at a steady and constant forward motion into a sausage casing for forming a sausage strand; and said apparatus including a gripper apparatus having rotating chains, and contricting forks fastened to said chains adapted to intermittently engage into said sausage strand to divide the latter into regular portions, the improvement comprising: said constricting forks being pivotably fastened to said chains; at least one guide means on said gripper apparatus for the displaceable guidance of said constricting forks; and end core forming a constriction in said sausage strand, said guide means causing said forks to divide and successively release said sausage strand immediately at said constriction formed by said end cone; and means for adjustably positioning said guide means so as to vary the extent of engagement of said forks into said sausage strand.

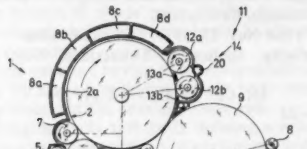
4,129,924
APPARATUS FOR SEPARATING CARD STRIPS DURING CARDING OF FIBROUS MATERIALS

Walter Wirth, Gausebrok, Fed. Rep. of Germany, assignor to Hergeth KG Maschinenfabrik und Apparatebau, Dulmen, Fed. Rep. of Germany

Continuation of Ser. No. 632,791, Nov. 17, 1975, abandoned.
This application Aug. 11, 1977, Ser. No. 823,690
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1974, 2459781
Int. Cl.[2] D01G *15/76*
U.S. Cl. 19—99 **6 Claims**

1. Apparatus for removing card strips, such as fiber naps, fiber adhesions, short fibers, foreign particles, waste fibers and the like from fibrous material during a carding operation comprising a carding cylinder carrying carding means in opposed relationship to carding means disposed about the exterior of

said carding cylinder, means for rotating said carding cylinder whereby said carding means cooperatively perform a carding operation upon fibrous material conveyed through the apparatus by said rotating carding cylinder, means for directly removing card strips from the fibrous material carried by the rotating carding cylinder independent of said carding means but during the performance of said carding operation by said carding means, said removing means including a strips roller disposed adjacent said carding cylinder and defining therewith a gap through which said fibrous material is carried by said rotating carding cylinder, means for rotating said strips roller, vacuum means for removing card strips from said strips roller, stripper plate means contiguous said gap for dividing the fibrous material into two portions from only one portion of



which is removed the card strips by said strips roller, means for adjusting the position of said stripper plate means to selectively alter the amount of fibrous material in each of said two portions whereby a select precentage of card strips are removed from said fibrous material depending upon the amount of fibrous material in said only one portion, said removing means includes another strips roller disposed adjacent said first-mentioned strips roller and adjacent said carding cylinder, said another strips roller and carding cylinder define another gap through which said fibrous material is carried by said rotating carding cylinder, means for rotating said another strips roller, said vacuum means being operative to remove card strips from said another strips roller, and said stripper plate means being disposed between said first-mentioned and another strips roller.

4,129,925

COMBINED NAIL FILE AND WRITING IMPLEMENT CLIP ATTACHMENT

Lorin B. Brown, 1501 S. Manhattan Pl., Los Angeles, Calif. 90019

Filed May 16, 1977, Ser. No. 797,260
Int. Cl.[2] B43K *25/00*
U.S. Cl. 24—11 CC **1 Claim**

1. A removable clip attachment for a writing implement or the like formed from a single piece of sheet metal, said clip attachment comprising:

a rectangularly shaped flat longitudinal strip portion having a pointed portion on the lower end thereof;

a split circular holder portion having an opening the diameter of which is substantially equal to the width of said longitudinal strip portion, said circular holder portion disposed opposite the back of the upper end of said longitudinal strip portion with its sidewall offset from and extending parallel to the plane of said longitudinal strip portion; and

a connecting link portion integrally joining the upper end of said longitudinal strip portion to the upper end of said circular holder portion, said connecting link portion having a width and length dimension on the order of one-half to one-third the width dimension of said longitudinal strip portion and having its sides forming substantially square corners where they join the upper end of said circular holder portion, and said connecting link portion having the shape of a semicircle with the upper end of said longitudinal strip portion and the upper end of said circular holder portion lying tangent to the ends thereof;

said longitudinal strip portion having the pointed portion on the lower end thereof bent sharply inwardly toward the axis of said circular holder portion and then sharply outwardly to form a bearing corner with the terminating end of said pointed lower end portion extending angularly outwardly;

whereby when said circular holder portion is fitted on the writing implement said bearing corner contacts the outer surface of the writing implement with a slight bearing pressure while said longitudinal strip portion is supported parallel to but offset from the surface of said writing implement; and

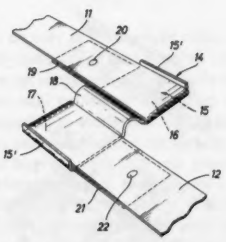
the outer surface of said longitudinal strip portion is abraded for use as a fingernail file.

4,129,926

FASTENING CLIP

Wolfgang H. Henning, Duetlingstal, 3538 Niedermarsberg, Nordrhein-Westfalen, Fed. Rep. of Germany

Filed Dec. 9, 1976, Ser. No. 749,112
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1976, 2600226
Int. Cl.[2] B65D *63/06*
U.S. Cl. 24—22 **4 Claims**



1. In a clip for fastening around a spirally-ribbed hose, of the kind comprising a band which encircles the hose and a bridge portion for tightening the band on the hose, the improvement wherein the band is overlapped, the overlapped parts lying side-by-side, the bridge portion connects the said overlapped parts together and means on said bridge portion for engaging the band between adjacent ribs of the hose.

4,129,927
TENSIONING OF METAL WIRES

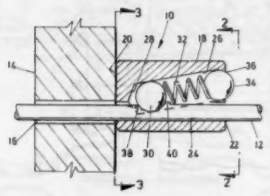
Nigel I. Anderson, Morgenzicht, Sloane St., Witkoppen, Transvaal, South Africa

Filed Jan. 6, 1977, Ser. No. 760,141

Claims priority, application South Africa, Jan. 22, 1976, 76/0364

Int. Cl.[2] F16G *11/00*

U.S. Cl. 24—136 A **13 Claims**



1. A device for holding under tension a length of wire having not more than two strands, said device comprising a body formed with a first passage to receive the wire and a second passage extending to a zone of intersection with the first passage at an angle of intersection less than 15°, a locking member located in the second passage and having a cross-sectional shape substantially similar to a cross-sectional shape of said second passage, a spring urging the locking member towards the zone of intersection, and means securing the spring in the body, the locking member and the second passage being of such a size relatively to the first passage that the locking member cannot enter any part of the first passage except that part included in the zone of intersection, the locking member being a body of revolution about an axis and being adapted to roll about that axis along the second passage and, on attempted withdrawal of the wire in one direction from the body, to lock between the wire and the surface of the second passage to prevent such withdrawal, the second passage terminating at the zone of intersection in a stop surface of the body inclined at an angle greater than 15° to the surface of the first passage on which the wire bears when locked and positioned so that the locking member, when engaging the stop surface, obturates only a part of the first passage, said body further having a third passage formed therein for receiving another length of wire, and a ferrule formed integrally with the body and providing an extension of the first and second passages.

4,129,928
SLIDE FASTENER

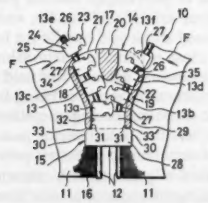
Takayuki Sugiyama, Kurobe, and Kihei Takahashi, Uozu, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 9, 1977, Ser. No. 775,976

Claims priority, application Japan, Mar. 17, 1976, 51/32103[U]

Int. Cl.[2] A44B *19/26, 19/36*

U.S. Cl. 24—205.11 R **3 Claims**



1. In a slide fastener comprising a pair of oppositely disposed stringer tapes carrying on and along their confronting longitudinal edges a pair of series of uniformly spaced interengageable fastener elements, a slider movable upwardly and downwardly along said fastener elements for respectively coupling and uncoupling the same, and a bottom end stop member interconnecting said stringer tapes adjacent to the bottom ends thereof, said slider including a body having a pair of spaced apart upper and lower wings each having a pair of guide flanges on and along the lateral edges thereof, said guide flanges extending between respective upward front ends and downward rear ends, said upper and lower wings being interconnected by a neck located at the front end of said slider to define together with said guide flanges a generally Y-shaped guide channel therethrough for guiding the movement of said fastener elements therethrough, and each of said fastener elements including a body of generally rectangular configuration having a pair of upward front and downward rear side faces and an outer end face, the improvement which comprises said end end stop members having a base portion against which the rear end of said slider abuts in its lowermost position to restrict the downward movement of said slider, said end stop member having a plug portion which extends from said base portion in a direction away from the bottom ends of said stringer tapes, and said plug portion being snugly receivable in the rear end portion of said Y-shaped guide channel for preventing said slider from tilting relative to said end stop member when said slider is in its lowermost position, and said slider having guide flanges of respective lengths so related to the pitch of said fastener elements and to the longitudinal offset spacing as between fastener elements that interengage, that when the slider is in its lowermost position, those two opposed fastener elements that are the uppermost fastener elements located within the guide channel, have their respective central axes located downwardly of the front ends of said guide flanges to reduce pivotal reaction forces on said uppermost fastener elements when oppositely directed lateral forces are applied to said stringer tapes; one of each pair of guide flanges having its front end extended beyond that of the other in the longitudinal direction of said slide fastener.

4,129,929
PROCESS FOR THE MANUFACTURE OF ELECTRICAL STACK OR LAYER CAPACITORS

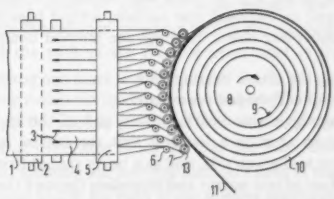
Hartmut Kessler, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 25, 1977, Ser. No. 818,674

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639184

Int. Cl.[2] H01G *4/30*

U.S. Cl. 29—25.42 **14 Claims**



1. A method for manufacturing electrical stack and layer capacitors in which master capacitors several times the length of a single capacitor are produced, comprising the steps of:

(a) providing at least one metallized synthetic band of a width many times that of capacitors to be manufactured, said band comprising a stretched synthetic film with elastic memory;

(b) cutting the synthetic band lengthwise into capacitor films corresponding to the width of a single capacitor;

(c) providing first and second guide means whose axes are perpendicular to one another;

(d) twisting each of the cut capacitor films by guiding them over the first and second guide means;

(e) stacking the cut capacitor films each upon the other in a laterally offset manner at a collector means and pressing them against each other to form a film packet unit; and

(f) frontally contacting the film packet unit by sprayed-on metal and sawing away individual capacitors, the heat from the sawing destretching the synthetic film in the region of the saw edges to rip the metal layers open into islands which are insulated from one another.

4,129,930

METHOD OF MANUFACTURING AN ELECTRICALLY CONTROLLABLE PIVOTING MIRROR DEVICE

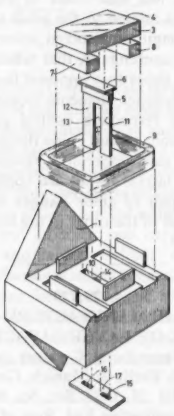
Jan C. W. Dragt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1977, Ser. No. 762,430

Claims priority, application Netherlands, Jan. 13, 1977, 7700294

Int. Cl.[2] B21D *53/10*

U.S. Cl. 29—149.5 R **8 Claims**



1. A method of manufacturing an electrically controllable pivoting mirror assembly of the type having a frame, a mirror pivotable about a given axis and having a reflecting front surface and an opposed rear surface, a rigid bearing support and a rubber-like elastic bearing; the method comprising the steps of

forming the elastic bearing with at least one portion thereof having a T-shaped cross-section;

affixing the elastic bearing to an end of the rigid bearing support at such a location that the mirror is pivotable about said given axis, said axis being spaced from the back surface of said mirror and extending through the T-shaped portion of the elastic bearing, said bearing consisting of a substantially rectangular portion and a single rib projecting from one side thereof;

affixing a side of the rectangular portion of the elastic bearing opposite the side from which the rib projects to the rear surface of the mirror subsequent to the formation of the bearing; and

affixing the rigid bearing support to said frame by said rib at a location such that the end of the rigid bearing support and the rear surface of the mirror project above a surface of the frame adjacent thereto to permit pivotal motion of the mirror.

4,129,931

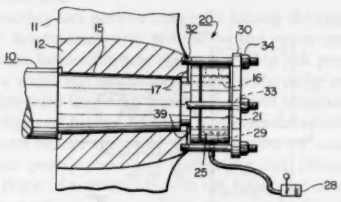
REMOVAL OF PROPELLERS FROM TAPERED SHAFTS

Eugene F. Carrigan, Louisville, Ky., assignor to Jeffboat, Incorporated, Jeffersonville, Ind.

Continuation of Ser. No. 763,131, Jan. 27, 1977, abandoned. This application Feb. 24, 1978, Ser. No. 880,954

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—252 **1 Claim**



1. Apparatus for removal of a propeller force fit upon a tapered shaft having screw threads on the end thereof extending at least to the outer end of the propeller hub when force fit in mounted position on said taper, said apparatus comprising in combination, a threaded nut fitted upon the shaft threads, said nut having a cylindrical body with a flange extending therefrom at the inner end spaced from the propeller by a predetermined small distance thereby to provide a stop for limiting movement of said propeller off said tapered shaft away from mounted position, a cylindrical axially expandible jack assembly mounted about said cylindrical nut body adjacent said flange axially expandible from a position near the end of said nut opposite said flange a distance greater than said predetermined small distance, a puller plate abutting the end of said jack at the outer end of said nut, said plate extending beyond the cylindrical dimensions of said flange and jack, a set of stud bolts affixed to said propeller hub and extending through mated apertures defined in said puller plates outside the periphery of said cylindrical jack assembly, and a set of nuts affixed to said stud bolts holding said puller plate firmly against said jack, whereby when said jack is axially expanded said propeller is moved down the taper on the shaft and against said stop by pressure exerted by said jack against said puller plate which in turn is transmitted to said propeller hub by said stud bolts and said stop limits the movement of the propeller while axial forces are being exerted by said jack.

4,129,932

METHOD AND MEANS FOR JOINING ELONGATE MEMBERS

Nicholas Stancati, Mountainside, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Nov. 14, 1977, Ser. No. 851,484

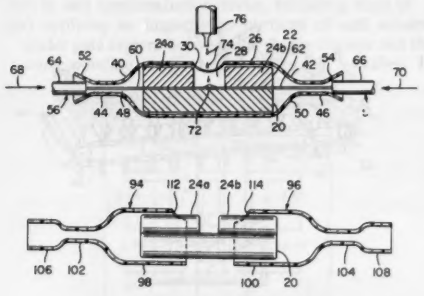
Int. Cl.[2] B23Q *17/00*

U.S. Cl. 29—407 **18 Claims**

1. A connector for elongate members comprising: a bundle of at least three elongate cylindrical elements juxtaposed in parallel orientation to provide an interior passageway coincident with the central axis of said bundle; and a heat contractable member disposed about said bundle for holding said cylindrical elements in close proximate relationship and having end portions extending beyond each end of said bundle, said end portions of said contractable member being heat contracted to provide a reduced interior opening therethrough for guiding said elongate members into said interior passageway.

10. A method of maintaining selective portions of two elongate members in axial alignment with one another comprising the steps of: providing a bundle of at least three elongate cylindrical elements arranged in parallel axial orientation; providing a heat contractable sleeve having a length greater than said bundle and an inner diameter slightly larger than the diameter of a circle tangentially encompassing said bundle; selectively

disposing said sleeve over said bundle so that each end of said sleeve extends beyond a respective end of said bundle; selectively heating each of said ends of said sleeve while applying a longitudinally directed outward force thereto to partially laterally contract and lengthen said ends; guiding the ends of said elongate members through the respective contracted ends of



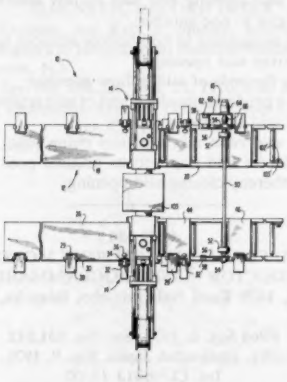
said sleeve; disposing said ends of said elongate members in end-to-end facing disposition adjacent one another within the axial center of said bundle; selectively heating said contractable sleeve along its length to contract said sleeve about said bundle and to further contract said ends of said sleeve about said elongate members.

4,129,933

METHOD AND APPARATUS FOR JOINING WOODEN MEMBERS USING ROLLED NAIL STRIPS PACKED WITHOUT ROLLS

J. Calvin Jureit, Coral Gables; Andrew G. Seipos, Miami, and William J. Langevin, North Miami Beach, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Filed Sep. 14, 1977, Ser. No. 833,059
Int. Cl.[2] B23P *17/00, 11/00;* **B27F** *7/02*
U.S. Cl. 29—417 **18 Claims**



1. A method of joining wooden members at their junctures with sheet metal connector plates of the type having integrally struck teeth projecting from one side of the metal plate, comprising:

(1) placing wooden members to be joined between first and second pressheads, at least one of which is compressively movable towards the other presshead and at least one of which is retractably movable away from the other presshead;

(2) providing a coiled composite of connector plate stock wherein first and second lengths of connector stock are in juxtaposition and the teeth of each length of connector stock are essentially completely intermeshed with the teeth of the other length of connector stock, whereby outer surfaces of the composite of connector stock have no teeth projecting therefrom;

(3) feeding the first length of connector stock to the first presshead and orienting the first length of connector stock so that the teeth thereof are pointed towards the wooden members to be joined and in the path of the relative movement of the pressheads;

(4) feeding the second length of connector stock to the second presshead and orienting the second length of connector stock so that the teeth thereof are pointed towards the wooden members to be joined and in the path of the relative movement of the pressheads;

(5) operating cutting means operatively associated with the pressheads for cutting connector plates from the connector stock, whereby predetermined lengths of connector plates are cut and positioned on opposite sides of the wooden members and at the junctures of the wooden members to be joined; and

(6) moving at least one of the pressheads to press the teeth of the connector plates into the wooden members and join the wooden members together.

18. Apparatus for joining wooden members at their junctures with sheet metal connector plates of the type having integrally struck teeth projecting from one side of the metal plate, comprising:

(1) first and second pressheads, at least one of which is compressively movable towards the other presshead and at least one of which is retractably movable away from the other presshead;

(2) receiving means for receiving and holding the wooden members to be joined together between the pressheads;

(3) support means for supporting a coiled composite of connector plate stock wherein first and second lengths of connector stock are in juxtaposition and the teeth of each length of connector stock are essentially completely intermeshed with the teeth of the other length of connector stock whereby outer surfaces of the composite of connector stock have no teeth projecting therefrom;

(4) feeding means for feeding the first length of connector stock to the first presshead and orienting the first length of connector stock so that the teeth thereof are pointed towards the wooden members held in the receiving means and in the path of the relative movement of the pressheads;

(5) feeding means for feeding the second length of connector stock to the second presshead and orienting the second length of connector stock so that the teeth thereof are pointed towards the wooden members held in the receiving means and in the path of the relative movement of the pressheads;

(6) cutting means operatively associated with the pressheads for cutting connector plates from the connector stock, whereby predetermined lengths of connector plates are cut and positioned on opposite sides of the wooden members and at the junctures of the wooden members to be joined; and

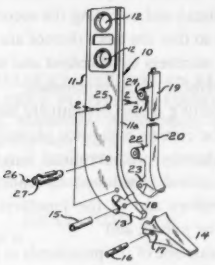
(7) moving means for moving at least one of the pressheads to press the teeth of the connector plates into the wooden members and join the wooden members together.

4,129,934

METHOD OF INSTALLING AND REMOVING LOCKING DEVICE FOR EARTH WORKING TOOL

Herman W. Gettman, Portland, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 683,175, May 4, 1976, abandoned. This application Oct. 4, 1977, Ser. No. 839,183
Int. Cl.[2] A01B *15/00*; F16B *19/02*
U.S. Cl. 29—427 3 Claims



1. A method of installing and removing the wearable part of a two part excavating tool comprising the steps of

providing a locking pin having resiliently enthickened portions disposed symmetrically relative to the longitudinal center line of said pin, said pin including a unitary relatively elongated body of generally cylindrical transverse section having diametrically opposed, longitudinally extending peripheral portions removed to provide a pair of recesses inwardly of the body ends to receive and support said resiliently enthickened portions, said resiliently enthickened portions including an elongated bearing piece in each of said recesses having a generally clyindrical outer wall portion and a pad for resilient material bonding each of said bearing pieces in its associated notch, said resilient material when not under compression being sized and arranged to position said outer wall portion radially outward of said generally cylindrical body,

providing a holder part having a bore constructed to receive said locking pin, said wearable part having spaced apart walls, said walls having aligned openings also being constructed to receive said locking pin,

installing said wearable part on said holder part so that said bore in said holder part and said openings in said wearable part are in alignment,

driving said locking pin into said aligned bore and openings with the driving force being transmitted along the longitudinal center line of said pin,

said openings in said wearable part being of a diameter slightly less than the width of said locking pin measured across said resiliently enthickened portions so as to cause equal compressive forces in said resiliently enthickened portions as said locking pin is driven through said openings in said wearable part,

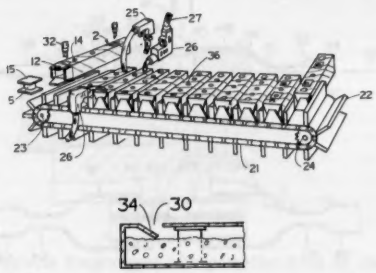
driving said locking pin out of said aligned bore and openings at a later point in time with the driving force being transmitted along the longitudinal center line of said pin, whereby shearing of said locking pin is substantially precluded because of equal compressive forces being exerted on said resiliently enthickened portions, and removing said excavating tool from said tool holder.

4,129,935

METHOD OF MAKING A MOLDED SUPPORT FOR AN OBJECT USING A SELF-CLOSING VALVE

Thomas G. Daley, 9716 Lanesboro Way, Louisville, Ky. 40222

Filed Aug. 18, 1977, Ser. No. 825,663
Int. Cl.[2] B23P *3/00, 19/04*
U.S. Cl. 29—460 7 Claims



1. A method for making a support for an object comprising the steps of:

(a) providing a hollow member having closed ends for addition of a resilient foam mix therein;

(b) cutting an opening in said hollow member leaving a flap therein over said opening;

(c) adding a predetermined amount of said resilient foam mix through said opening; and,

(d) curing said resin mix whereby rising foam during said curing forces said flap into its original position prior to cutting thereby closing said opening.

4. A method for making a support for an object comprising the steps of:

(a) providing a hollow member having open ends for addition of a resilient foam mix therein;

(b) inserting into said hollow member at preselected positions therein inserts with an opening therethrough, the axes of said opening and said hollow member being at right angles to one another;

(c) cutting an opening in said hollow member leaving a flap therein over said opening;

(d) closing the ends of said hollow member;

(e) adding a predetermined amount of said resilient foam mix through said opening; and,

(f) curing said resin mix whereby rising foam during said curing forces said flap into its original position prior to cutting thereby closing said opening.

4,129,936

METHOD FOR MANUFACTURING MONOLITHIC SEMICONDUCTOR MASK PROGRAMMABLE ROM'S

Sakae Takei, 1028 Kami Nakazato-cho, Isogo-ku, Yokohama-shi, Japan

Filed Sep. 8, 1977, Ser. No. 831,512
Claims priority, application Japan, Sep. 9, 1976, 51-107238
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 8 Claims

1. A method for manufacturing a monolithic semiconductor mask programmable ROM composed of a plurality of matrix-arranged IGFET's, comprising:

(a) a process for manufacturing a semiconductor device with no information yet written therein, including steps of

(i) forming a plurality of relatively thick rectangular oxide layers for separating said IGFET's from one another at intervals on a substrate,

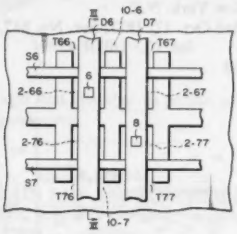
(ii) forming a relatively thin gate oxide layer all over said substrate and further forming a number of selective lines to be supplied with input signals, said selective lines

being arranged across said relatively thick separating oxide layers at intervals on said gate oxide layer, and

(iii) forming a number of source and drain regions by removing said relatively thin gate oxide film in regions surrounded by said selective lines and said relatively thick separating oxide layers and diffusing an impurity with conductivity opposite to that of said substrate; and

(b) a process for completing said ROM by writing information in said semiconductor device, including steps of

(iv) applying an impurity to portions of said substrate under gate regions between the source regions and their corresponding drain regions forming specified IG-



FET's selected from a number of IGFET's to form said semiconductor device according to an order from user through the gate oxide layer and the selective lines on said portions of the substrate, thereby changing the impurity concentration of said portions of the substrate with respect to that inherent in said substrate, and

(v) covering the whole surface of said semiconductor device with an oxide layer, boring contact holes through said oxide layer on said drain regions, and forming a number of data lines to produce a plurality of data, said data lines passing over said contact holes at intervals across said selective lines and connected to said drain regions through said contact holes.

4,129,937

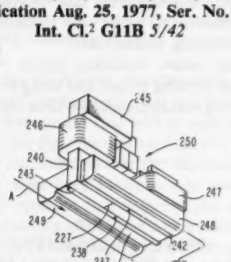
METHOD OF MAKING GROUNDED TRANSDUCER FOR MAGNETIC RECORD DISKS

Gerald R. Knutson, and Karl A. Shidler, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 698,235, Jun. 21, 1976, Pat. No. 4,058,846. This application Aug. 25, 1977, Ser. No. 827,530

Int. Cl.[2] G11B *5/42*

U.S. Cl. 29—603 **5 Claims**



1. In a method of making a magnetic head assembly, the steps which comprise,

making a ferrite core having a transducer gap in a working surface of the ferrite core,

making an outrigger of ceramic material,

plating the outrigger on at least a pair of contiguous surfaces thereof with a layer of electrically conducting material,

bonding said outrigger to said ferrite core with one of said plated surfaces being disposed between the ferrite core and said outrigger and with the other of said plates surfaces forming a continuation of said working surface of said ferrite core, and

lapping said working surface of said ferrite core and the continuation thereof provided by said outrigger so as to form an accurate working surface of the magnetic head assembly and to remove the plating on said surface of said outrigger forming a continuation of said working surface of said ferrite core leaving the conductive plating between said ferrite core and said outrigger which may provide a conductive path for static electricity carried by a magnetic medium contacting or lying in close proximity to said working surface.

4,129,938

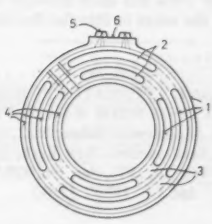
METHOD OF MAKING TUBULAR COILS WITH COOLING AND INSULATING CHANNELS

Hariolf Hagenbucher, Zimmersmühlenweg 10/11, D-637 Oberursel, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 607,426, Aug. 25, 1975, abandoned, which is a continuation of Ser. No. 407,189, Oct. 17, 1973, abandoned. This application Oct. 5, 1976, Ser. No. 729,798

Int. Cl.[2] H01F *41/06*

U.S. Cl. 29—605 **2 Claims**



1. A method of making a hollow dry insulated multi-layer series-connected air-cooled coil, which is highly resistant to impulse voltages, the steps comprising:

a. on a form, winding a predetermined number of alternate layers of thin sheet insulation capable of absorbing liquid resin and turns of a single conductor;

b. supporting on the thus-wound layers, a plurality of elongated equi-circumferentially spaced duct forming cloth-wrapped molds each having a cross-section which is a section of a torus with the section having rounded ends;

c. continuing winding alternate layers of said thin sheet insulation and additional turns of said conductor around the assembly of molds and underlying layers of insulation and conductor;

d. repeating the foregoing steps until the desired number of layers and molds is complete;

e. vacuum casting the completed assembly with a high dielectric constant high quality resin to completely permeate the sheet insulation and cloth wrapping;

f. curing said resin to form a unitary laminate with said cloth and insulation; and

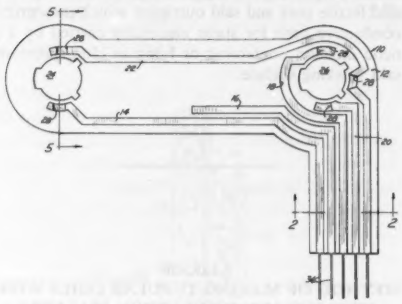
g. removing said form and molds, the radial dimension of said ducts defining the radial air spacing between layers of the coil and being about ten to twenty times the solid insulation spacing between adjacent conductors in the same layer and the solid insulation between the coils and the adjacent duct which latter dimension is held to between 0.5 and 1.0 mm.

4,129,939

METHOD OF MAKING PRINTED CIRCUIT

Joseph W. Baldyga, Mt. Clemens, Mich., assignor to Diamond Die & Mold Co., Mt. Clemens, Mich.

Filed Aug. 22, 1977, Ser. No. 826,514
Int. Cl.[2] H05K *3/10*
U.S. Cl. 29—625 **14 Claims**



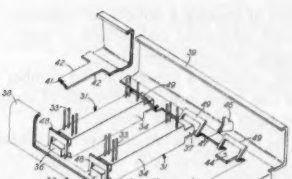
1. The method of making the equivalent of a printed circuit comprising a sheet of insulating material having thereon a plurality of separated insulating strips adapted to be connected into electrical circuitry, which comprises shaping a plurality of circular cross-section conducting wire to the shape of the desired conducting strips, fixing the shaped wires in the desired pattern on a thin sheet of insulating material, and finally pressing the assembly of wires and sheet between flat opposed die surfaces to reduce the wires to thin flat flexible strips.

4,129,940

METHODS OF AND APPARATUS FOR ASSEMBLING CONNECTORS WITH A BACK PLATE

Henry D. Mitchell, Jr., Winston-Salem, N.C., assignor to Western Electric Co., Incorporated, New York, N.Y.

Filed Aug. 30, 1977, Ser. No. 829,161
Int. Cl.[2] H02G *15/00*
U.S. Cl. 29—629 **16 Claims**



1. A method of assembling a connector with a support plate where the connector includes a first end and a second end; and the support plate includes a connector-receiving opening, a fixed connector-securing clasp on one side of the plate adjacent to a first edge of the opening and a bendable connector-securing clasp on the same side of the plate adjacent to a second edge of the opening opposite to and spaced from the first edge thereof, which comprises the steps of:

moving a connector-receiving nest at least partially through the opening in the support plate to the side of the plate which includes the clasps with the fixed clasp located at one end of the nest;

feeding the connector into the nest with the first end of the connector extending from one end of the nest and into the fixed clasp and the second end of the connector extending from the opposite end of the nest;

moving the nest back through the opening of the plate to position the connector partially into the opening and the second end of the connector adjacent to the bendable clasp of the plate; and

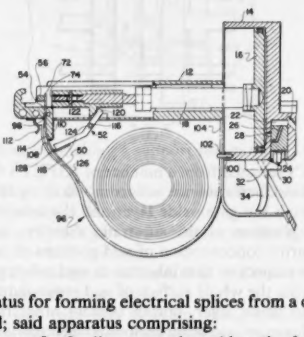
bending the bendable clasp over the second end of the connector to secure the connector with the support plate.

4,129,941

SPLICE GUN

Irwin Zahn, New York, N.Y., assignor to General Staple Company, Inc., New York, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,572
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—753 **17 Claims**



1. Apparatus for forming electrical splices from a continuous supply band; said apparatus comprising:

feeding means for feeding a preselected length of said supply band to a forming station;

clinching means positioned beneath said forming station;

forming means for forming said preselected length into a generally U-shaped configuration;

driving means for driving said U-shaped configuration into said clinching means, said driving means being disposed within said forming means;

operating means for simultaneously moving said forming means and said driving means is a forward direction for a preselected length of travel sufficient to effect formation of said U-shaped configuration by said forming means and for thereafter moving only said driving means in said forward direction to drive said U-shaped configuration into said clinching means; and

said operating means including piston means extending through said forming means and being directly connected to said driving means disposed within said forming means.

4,129,942

SHAVING IMPLEMENT

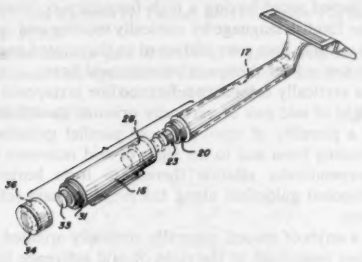
Nejat H. Denizman, 676 W. Diversey Ave., Chicago, Ill. 60614

Filed Sep. 12, 1977, Ser. No. 832,586
Int. Cl.[2] B26B *21/44*
U.S. Cl. 30—41 **22 Claims**

1. In a shaving implement having means defining a shaving head, the improvement comprising

a handle having a first portion carrying said shaving head suitably to permit the implement to be used as a manually operable razor, said handle first portion defining a chamber removably holding dispensable shaving-associated material, said handle further including an extension portion removably secured to said first portion and defining a second chamber removably holding a different shaving-

associated material, said extension portion further defining means for selectively retaining the shaving-associated



material in said first chamber to permit selective dispensing thereof as desired.

4,129,943

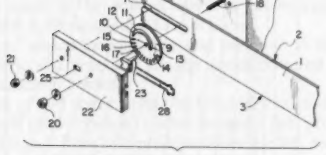
CHAIN SAW BAR TIGHTENER

Norman C. Bricker, R.R. #2, Coleman Rd., Courtenay, B. C., Canada (V9N 5M9)

Filed Nov. 25, 1977, Ser. No. 854,732

Int. Cl.[2] B27B *17/14*

U.S. Cl. 30—386 **1 Claim**



1. A chain saw bar tightener for a chain saw having a chain bar of substantially elongated plate-like configuration having elongated top and bottom edges with a groove formed therein for guiding a chain, front and back edges with a groove for guiding the chain and a slot extending into the chain bar substantially parallel to the top and bottom edges from the back edge, and a housing casting, said chain saw bar tightener comprising

a disc having an axial bore therethrough, a substantially semiannular slot having a diameter smaller than that of the disc formed through the disc with its ends substantially on a diameter of the disc, the semiannular slot having one end adjacent the circumference of the disc and the other end adjacent the axial bore between said bore and a point diametrically opposite that adjacent the one end of the slot, and a plurality of spaced accommodation slots extending radially in mutually spaced relation in the area of approximately half the circumference of the disc;

disc mounting means for rotatably mounting the disc for rotation via a stud passing through the slot of the chain bar and affixed to the housing casting; and

a bar pin passing through the semiannular slot of the disc and into the chain bar slot in a manner whereby when the disc is rotated by a tool in the accommodation slots of the disc in a manner whereby when the bar pin is given a forward thrust, said bar pin is moved forward thereby moving the chain bar to tighten the chain of the saw and when said bar pin is given a backward thrust, said bar pin is moved backward thereby permitting the chain bar to loosen the chain of the saw.

4,129,944

DENTAL CONSTRUCTIONS AND DENTAL ALLOYS

Pei Sung, Lawrenceville; Irving Klaus, Highland Park Borough, and James Lee-You, Cranbury, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.Y.

Continuation-in-part of Ser. No. 546,642, Feb. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 376,767, Jul. 5, 1973, abandoned. This application Feb. 24, 1977, Ser. No. 771,507

Int. Cl.[2] A61C *13/00*

U.S. Cl. 32—8 **6 Claims**

1. A dental restorative construction comprising a metal core of a non-precious metal alloy contoured in a desired form and a porcelain covering bonded thereto, said metal core being an alloy consisting essentially of, on a weight basis, about 65 to 75 percent nickel, about 15 to 23.5 percent chromium, about 3.5 to 6 percent silicon, about 3 to 5 percent molybdenum, and about 0.2 to 2 percent boron, said alloy having a fusion temperature within the range of 2050° F. to 2350° F. and a coefficient of expansion in the range of from about 13.0×10^{-6} in/in/° C. to about 13.8×10^{-6} in/in.°C.

4,129,945

CLAMPING DEVICE FOR DENTAL HANDPIECE

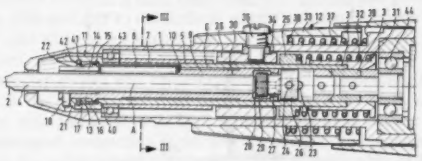
Eugen Eibofner, Biberach, Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach, Germany

Filed Jun. 29, 1977, Ser. No. 810,990

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718750

Int. Cl.[2] A61C *1/10*

U.S. Cl. 32—26 **12 Claims**



1. In a clamping device for clamping a dental tool to a dental handpiece, said handpiece having an elongated handpiece sleeve containing a drive shaft to drive a tooth treatment tool and having a hollow end portion on the output side to receive the shank of said dental tool, said hollow end portion having inner and outer circumferential walls and having depressions distributed over said inner circumferential wall said depressions being of decreasing depth as viewed in radial section, roll bodies being externally suspended from the interior of said drive shaft at said depressions to form a roll clamping lock retaining the tool during rotation of the drive shaft, a bushing in said hollow end portion of said drive shaft, said bushing having suspension openings to suspend said roll bodies, said suspension openings comprising a roll body or anti-friction cage, said openings permitting application of said roll bodies against the tool shank into a clamping position of said roll bodies, and said bushing including a pre-clamping element into which the shank is inserted for retention thereof prior to commencement of the rotation of said drive shaft, the improvement comprising:

a ring having a wedge-shaped axial section mounted in said hollow end portion of said drive shaft and held thereto against rotational and axial movement relative thereto, said ring including and inclined inner wall which tapers in a direction away from the tool side end; and,

said bushing including a collet axially movable in said cavity relative to said drive shaft;

an external grip coupled with said collet for axially moving thereof along a longitudinal axis thereof into tool clamping and release positions;

said collet including at a tool receiving end thereof said

pre-clamping element, said pre-clamping element comprising a plurality of radially flexible clamping tongues having slots between each pair of adjacent tongues starting from the tool receiving end of said collet, each of said tongues including an outer radial hump, and at least one outer radial guide pin protruding from said collet into a triangular recess, said pin having a tip pointing in a direction of the longitudinal axis of symmetry of said drive shaft;

said drive shaft having said triangular recess disposed in said circumferential wall of said drive shaft, said triangular recess including a pair of oppositely disposed inclined flanks meeting at a point forming a triangle apex;

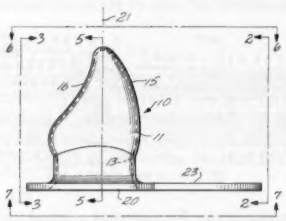
said guide pin being movable with said collet to abut one of said inclined flanks of said triangular recess and said roll bodies being moved to their tool shaft clamping position during mutual rotation of said drive shaft and said collet as a unit, and said guide pin engaging one of said inclined flanks when said roll bodies are in their clamping position and being cammed along said inclined flank to said triangle apex when said external grip moves said collet to its release position, and thereby also release said roll bodies from their clamping position.

4,129,946

DENTAL CROWN FORM

Brian G. Kennedy, Claremont, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Feb. 17, 1977, Ser. No. 769,549
Int. Cl.[2] A61C *5/12*
U.S. Cl. 32—63 **5 Claims**



1. In a dental crown form for holding and shaping a restoration material being applied to a prepared damaged tooth, the crown form being a hollow body with an incisal end, an open gingival end, and interior labial, lingual, and interproximal surfaces forming a continuous sidewall conforming in shape to a desired final restored state of the damaged tooth, the improvement comprising a tab secured to the crown form adjacent the gingival end of the body to provide a handle by which the crown form can be held during insertion of the restoration material and when the crown form is installed on the damaged tooth, the tab being integrally formed with the hollow body of the crown form, and extending substantially perpendicularly to an occluso-apical axis of the crown form.

4,129,947

GAUGE AND METHOD FOR DETERMINING THE NUMBER OF WORDS PER PRINTED PAGE

Carl F. Brown, Jr., 105 Fernbrook Cir., Spartanburg, S.C. 29302

Filed Nov. 18, 1977, Ser. No. 852,618
Int. Cl.[2] B42D *15/00;* **G01B** *5/00*
U.S. Cl. 33—1 B **3 Claims**

1. A gauge for determining the number of words per line on a printed page:

(a) a rectangular transparent sheet adapted for having measuring indicia inscribed thereon and for being superimposed on a page of printed material; and

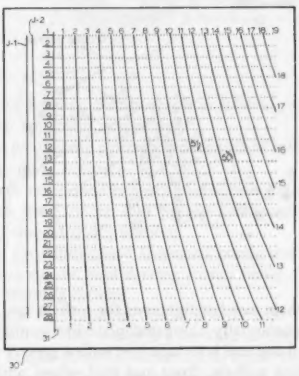
(b) measuring indicia inscribed thereon including:

(i) a pair of opposing substantially vertically oriented measuring lines positioned along the left side of said transparent sheet and spaced such that the distance between them gradually increases in a downward direction, said lines being adapted to measure the width of a selected word having a high frequency occurrence in the English language by vertically moving said opposed measuring lines over said word on the printed page until said word fits the space between said lines;

(ii) a vertically extending reference line juxtaposed to the right of said pair of vertically oriented guidelines;

(iii) a plurality of equally spaced parallel guidelines extending from and to the right of said reference line in perpendicular relation thereto to form horizontally disposed guidelines along the length of said reference line;

(iv) a series of spaced, generally vertically oriented guidelines positioned to the right of said reference line and intersecting said horizontally disposed guidelines to form a grid therewith, said generally vertically oriented guidelines being spatially arranged such that the distance between adjacent points of intersection with said horizontally disposed guidelines at any vertical level



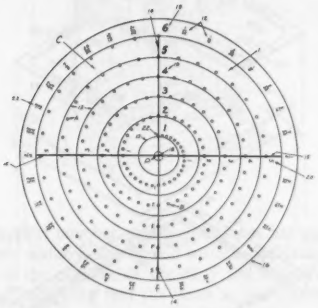
bears a constant proportional relation to the distance between said pair of opposing substantially vertically oriented measuring lines at the same vertical level; and

(v) a first scale in which each horizontally disposed guideline is identified by a reference indicia and a second scale wherein each generally vertically oriented guideline is likewise identified by a numerical value representative of the average number of words in a line, thereby adapting said gauge to be employed for determining the number of words per line on a printed page to be determined by locating and jamming the selected word between said pair of opposing vertical lines, noting the corresponding reference indicia on said first scale, aligning said reference line with the left vertical edge of the printing on said printed page and with the said horizontal guideline corresponding to said first scale indicia beneath a line of print on said page and finally noting where the line of print above said horizontal guideline terminates in reference to the closest of said vertical guidelines and using the numerical values of said scale assigned to indicate said number of words per line.

4,129,948
CIRCLE DRAWING AND MEASURING DEVICE

Edward E. Hatter, 25892 Serenata Dr., Mission Viejo, Calif. 92675, and Richard H. Taylor, 13691 Gershon Pl., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 771,014, Feb. 22, 1977, abandoned. This application Mar. 15, 1978, Ser. No. 886,877
Int. Cl.[2] B43L *9/04*
U.S. Cl. 33—27 C 35 Claims



1. A drafting and measuring compass for the drafting and measuring of circles, which comprises:

(a) a template adapted to be disposed on a sheet of paper in parallel relationship to said paper and adjacent thereto,

(b) centering means associated with said template to enable the same to be rotated about a predetermined center which is fixed relative to said paper,

(c) zone means provided on said template to indicate concentric and generally annular zones centered at said predetermined center,

each of said zones having its boundary relatively adjacent said predetermined center located a first predetermined distance from said predetermined center, and having its boundary relatively remote from said predetermined center located at a second and higher predetermined distance from said predetermined center,

said boundaries and predetermined distances being such that the user may quickly and easily know that a particular point on said template is located more than a certain distance from said predetermined center and less than the next higher distance therefrom, and may also know the magnitudes of said distances on the particular distance sacle being employed on said compass,

(d) a multiplicity of holes provided in said template and each adapted to receive a drafting instrument which will make a line on said paper in response to rotation of said template about said predetermined center so that a circle is drawn on said paper,

said holes lying generally along radial lines from said predetermined center and also lying in various ones of said annular zones,

all the holes located a first predetermined fraction of each whole number of said particular distance scale being employed on said compass being disposed generally along one such radial line,

all the holes located a second predetermined fraction of each whole number of said particulr distance scale being employed on said compass being disposed generally along another such radial line,

all of the holes located various additional predetermined fractions of each said whole number being respectively located generally along various additional radial lines, and

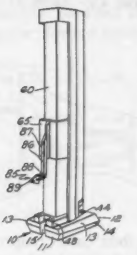
(e) indicating means on said template to indicate which one of said fractions each of said radial lines represents,

whereby the relationship of any one of said holes to said predetermined center may be rapidly known by using (1) said indicating means and the radial line for the particular fraction and (2) said zone means indicating zones.

4,129,949
HEIGHT GAGE

Robert P. Callaghan, Jr., Westerly, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Continuation-in-part of Ser. No. 673,727, Apr. 5, 1976. This application Dec. 19, 1977, Ser. No. 861,957
Int. Cl.[2] G01B *5/14*
U.S. Cl. 33—169 R 5 Claims

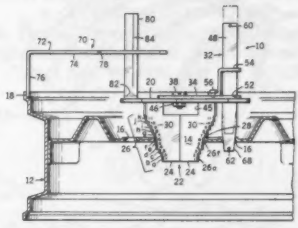


1. In a height gage, a generally horizontally disposed base and a generally vertically disposed column extending upwardly therefrom, said column having a plurality of vertically disposed surfaces, a slide embracing said column and presenting slide surfaces to the surfaces of said column, characterized by said slide being expandible and formed by a plurality of plates, resilient means connecting said plates, said means of a character to flex and cause expansion of the embracing slide upon the existence of fluid pressure between the surfaces of said slide and column to form a frictionless fluid bearing and subsequent contraction in the absence of such fluid pressure to grip the column, said slide surfaces having a plurality of fluid openings and means to supply fluid to said fluid openings to expand said slide.

4,129,950
WHEEL GAUGE

Theodore Weinhaus, 7 Heartwoods, St. Louis, Mo. 63132, and Allen Fischer, St. Louis, Mo., assignors to Theodore Weinhaus, St. Louis, Mo.

Filed Jul. 25, 1977, Ser. No. 818,448
Int. Cl.[2] G01B *5/08*
U.S. Cl. 33—178 R 10 Claims



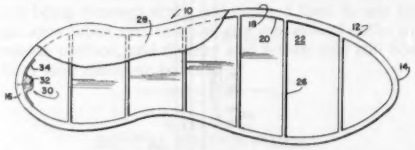
1. A wheel gauge comprising:

(a) base means,

(b) hub opening diameter indicator means attached to the base means and adapted to axially interfit a selected hub opening and including reference means indicating the diameter thereof, and

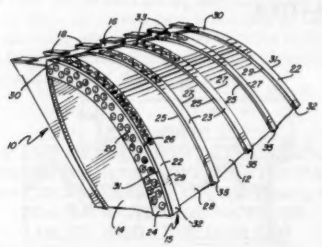
(c) bolt circle diameter indicator means attached to the base means and adapted to axially interfit a selected wheel bolt opening while the hub opening indicator means is in position, and including reference means indicating the bolt circle diameter thereof.

4,129,951
AIR CUSHION SHOE BASE
Charles Petrosky, 1118 N. Jefferson St., Arlington, Va. 22205
Filed Apr. 20, 1976, Ser. No. 678,658
Int. Cl.[2] A43B *13/20*
U.S. Cl. 36—29 **9 Claims**



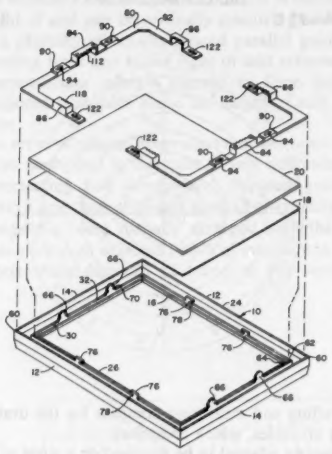
1. An air cushion shoe base comprising a flexible sole for contacting the floor, a flexible insole positioned above the sole for contacting a foot of a wearer, a rim extending around a periphery of the sole and insole for connecting the sole and insole in airtight relationship, and flexible partitions extending transversely across the rim from side to side between the sole and the insole for dividing the shoe base into plural inflatable transverse compartments, each of the partitions having a small metering orifice for flowing fluid through the metering orifice from one section to another section, and means joining the sole, the rim, the insole and the partitions in airtight relationship.

4,129,952
WEAR STRIPS FOR EARTHMOVING BUCKETS
Harris S. Olson, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 27, 1977, Ser. No. 846,005
Int. Cl.[2] E02F *3/00*
U.S. Cl. 37—118 R **15 Claims**



1. A wear-resistant bucket having a bottom wrapper sheet joined with a pair of spaced apart side plates, a side strip carried by each side plate and mounted near said bottom wrapper sheet, at least two bottom strips carried by said bottom wrapper sheet, said bottom strips being mounted near said side plates, and a plurality of wear-resistant inserts bonded into said side strips and said bottom strips.

4,129,953
POSTER FRAME AND MOLDING METHOD
Ronald P. Eckert, Northbrook, Ill., assignor to DLM Inc., Niles, Ill.
Filed Sep. 29, 1977, Ser. No. 837,740
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—156 **7 Claims**

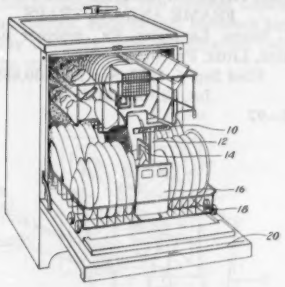


1. A picture frame comprising:
a unitary frame having end and side portions of U-shaped cross-section defined by an outer trim wall, a peripheral wall and an inner wall;
said outer wall having a width greater than said inner wall;
an intermediate wall extending between and in spaced relationship with said peripheral and inner walls;
said intermediate wall having a width greater than said inner wall to provide a rimmed recess to receive the edge of said picture;
an end and a side of said frame each having a pair of tab members extending in the plane of and from said intermediate wall;
said tab members on said end of said frame having opposed notches on the sides thereof;
said tab members in said side of said frame having notches on a side away from said end of said frame; and
at least one U-shaped clamp member adapted to hold said edge of said picture within said rimmed recess;
said clamp member having a body portion and a pair of leg members having slots registrable with said tab members and engageable into said notches whereby to snap-fit against the edges of said picture.

4,129,954
DISHWASHER INDICATING DEVICE
James M. Hulteen, Antelope Hill, Austin, Colo. 81410
Filed Jul. 5, 1977, Ser. No. 812,848
Int. Cl.[2] G09F *7/20*
U.S. Cl. 40—607 **3 Claims**

1. A dishwasher indicating device for indicating the condition of items in a dishwasher, said dishwasher having a movably mounted rack for supporting dishes, tableware, eating utensils, and the like, to be washed, said dishwasher indicating device comprising
a support member affixed to the rack of a dishwasher and extending upright from said rack, said support member comprising a substantially tubular member having an upper free end and an axial bore of substantially square cross-section formed therein at said upper free end; and
an indicator having a support rod of substantially square cross-section with spaced opposite first and second ends

and a sign member affixed to the first end of said support rod and extending substantially perpendicularly with said support rod to form a T-shaped member, the second end of said support rod being removably seated in the bore of



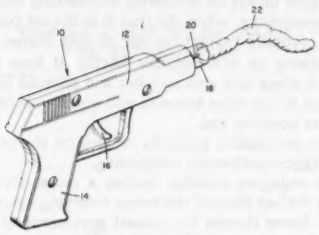
said support member, said sign member having a pair of opposite surfaces, one of said surfaces indicating that the items in the dishwasher are dirty and the other of said surfaces indicating that the items in said dishwasher are clean.

4,129,955

ARTICLE FOR INJECTING AIR INTO LIVE BAIT

John Schommer, 17204 McFadden, Apt. B, Tustin, Calif. 92680

Filed Aug. 13, 1977, Ser. No. 824,433
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—4 **6 Claims**



1. In a device for injecting a fluid or the like into live bait, the combination comprising:

a body member having a cavity formed therein;

a barrel member supported partially within said cavity and having an opening extending therethrough;

plunger means within said cavity in sliding engagement within one end of said opening;

hypodermic needle means within said opening adjacent the other end of said barrel, said hypodermic needle means including a hypodermic needle centrally disposed with respect to said opening and recessed within said barrel; and

means for actuating said plunger member to force fluid from within said barrel member.

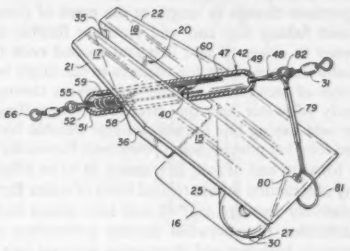
4,129,956

DIVING PLANE FOR FISHING

Joseph F. Neary, Novato, Calif., assignor to Troller Corporation, Corte Madera, Calif.

Filed May 17, 1977, Ser. No. 778,829
Int. Cl.[2] H01K *95/00*
U.S. Cl. 43—43.13 **3 Claims**

1. In diving apparatus useful for fishing including a release member serially connectable to a towed fishing line, said release member having a first end connected to the leading end of said line, a second end connected to the trailing end of said line, a first catch member therebetween for opening from a closed position upon a predetermined amount of tension in said release member between said ends, and a central portion of predetermined transverse dimension adjacent said first catch member, a planar diving platform being formed with a leading base area, first and second trailing flukes separated to define first and second edges of a slot rearwardly extending from the leading base member; a connector having a first end mounted to said platform at said base and a second end mounted to the first end of said release member to permanently attach said platform to said first end of said release member; a second catch member spanning said slot for maintaining said release member at said first catch member within said slot to releasably attach said release member to said platform whereby said platform and release member between said first end and said first catch member together form a towing bridle on one side



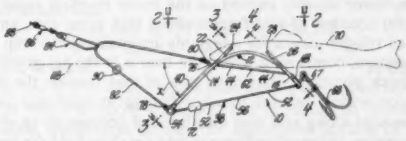
of said platform for pulling said platform through water at a preselected and constant diving angle, the improvement comprising: first and second fin members formed from and supported on said first and second flukes respectively at said slot extending normally to the planar platform; wherein said first and second fins are juxtaposed to the first and second side edges of said slot to form first and second uninterrupted planar surfaces defining a channel of a width generally that of the predetermined transverse dimension of said release members; said fins allowing said release member to slide into and out of said channel along said slot, but preventing said release member from undergoing side-to-side rotation and translation relative to said diving platform; said fins further inhibiting side-to-side movement of said diving platform relative to said water; such that said release member is held with respect to said connector to form a three-dimensional spaced towing bridle for said platform whereby said platform dives in a substantially vertical plane.

4,129,957

FISHING BAIT HARNESS, FISHING LURE, AND ATTACHMENT MEANS

Thomas E. Thirlby, Traverse City, Mich., assignor to Edward W. TenHouten, Cadillac, Mich., a part interest

Filed Nov. 19, 1976, Ser. No. 743,138
Int. Cl.[2] A01K *85/00, 83/06*
U.S. Cl. 43—42.49 **16 Claims**



1. Apparatus for towing through a related body of water fishing lure means having a relatively forward end and a relatively rearward end, comprising sling-like attachment means

operatively secured to said relatively forward end of said lure means, said attachment means comprising a generally elongate flexible body having at least first and second ends, said first end being operatively secured to said relatively forward end of said lure means as to be situated at a relatively higher elevation, said second end being operatively secured to said relatively forward end of said lure means as to be situated at a relatively lower elevation, said elongate flexible body being connectible to related fishing line means at a location generally anywhere along said elongate flexible body between said first and second ends, said elongate flexible body being of an effective length causing said elongate flexible body to form a looped configuration extending a substantial distance forwardly of said first and second ends and a substantial distance forwardly of said relatively forward end of said lure means, said looped configuration defining generally first and second loop leg portions respectively terminating in said first and second ends, said flexibility of said elongate flexible body enabling said looped configuration to undergo changes in configuration whereby said loop leg portions change in length as the point of connection between said fishing line and said elongate flexible body is moved closer to either of said first and second ends thereby automatically compensating for changes in the angle between the direction of movement of said lure means through said related body of water and the direction of a pulling force applied by said fishing line to said elongate flexible body, and said second loop leg portion being positioned forwardly of said relatively forward end of said lure means as to be effective to engage any obstruction in said related body of water forwardly of said relatively forward end of said lure means and cause relative deflection therebetween thereby preventing undesirable snagging as between said obstruction and said lure means.

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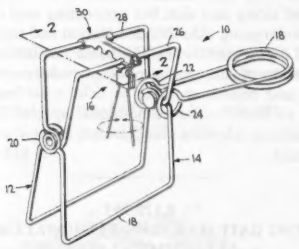
OMNI-DIRECTIONAL TRIGGER MECHANISM FOR ANIMAL TRAPS

Frank R. Conibear, Victoria, Canada, assignor to Woodstream Corporation, Lititz, Pa.

Filed Aug. 11, 1977, Ser. No. 823,862
Int. Cl.[2] A01M *23/24*
U.S. Cl. 43—92 **10 Claims**



1. In an animal trap having similar first and second frames, each frame having side members serving as jaws and end portions extending therebetween, the end portion being pivotally connected for relative rotation of the frames between set and closed positions about a common pivot axis, and at least one actuator slidably carried on the frame to effect rapid and forceful rotation of said frames about said pivot axis, an improved trigger means for releasably maintaining the trap in a set position, comprising, when the trap is in the set position:

a latch pivotally carried on one of said frames, the latch comprising an arm member having at least one notch spaced along said arm member and adapted to receive a portion of the other frame in said notch to hold the frames in a set position; and,

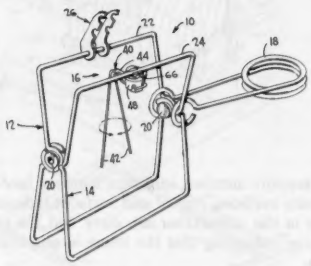
a trigger mechanism pivotally carried on the other frame, portions of the trigger mechanism engaging said latch and being angularly displaceable about said other frame in any direction to release said other frame from said notch and thereby to release said frames for relative rotation.

4,129,959

UNIVERSAL TRIGGER MECHANISM FOR ROTATING FRAME ANIMAL TRAPS

Anthony J. Souza, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed Sep. 6, 1977, Ser. No. 830,885
Int. Cl.[2] A01M *23/24*
U.S. Cl. 43—92 **12 Claims**



1. In an animal trap having similar first and second frames, each frame having side members serving as jaws and end portions extending therebetween, the end portions being pivotally connected for relative rotation of the frames between set and closed positions about a common pivot axis, and at least one actuator slidably carried on the frames to effect rapid and forceful rotation of said frames about said pivot axis, an improved trigger means for releasably maintaining the trap in set position, comprising, when the trap is in the set position:

a latch pivotally carried on one of said frames, the latch comprising an arm member having at least one notch spaced along said arm member and adapted to receive a portion of the other frame in said notch to hold the frame in a set position; and,

a trigger mechanism pivotally carried on the other frame, the trigger mechanism comprising,

a frame engaging member having a recess formed in an upper surface thereof, the recess receiving a portion of the other frame therein for pivotal movement of the frame engaging member about said portion of the other frame,

a body member having a recess formed therein, at least a portion of the frame engaging member being loosely received within the recess in the body member,

means for mounting the frame engaging member within the recess of the body member for relative rotation therebetween; and

cam means on at least a portion of the body member for engaging at least portions of the latch, the body member being angularly displaceable about said portion of said other frame in any direction to release said other frame from said notch and thereby to release said frames for relative rotation.

4,129,960

INTERLOCKING BLOCKS

John A. Gale, Excelsior, Minn., assignor to American Guidance Service, Inc., Circle Pines, Minn.

Filed Jun. 9, 1976, Ser. No. 694,170
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—25 **8 Claims**

7. Interlocking educational and recreational hollow cubic blocks each having:

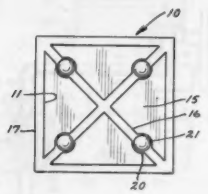
(A) four vertical square side walls,

(B) a horizontal square top wall,

(C) a flat square bottom surface, said bottom surface defining

an open face of said hollow block, said bottom surface further comprising the edges of intersecting diagonal ribs extending vertically down from said top wall within said hollow block,

(D) four male interlock members on said ribs projecting perpendicularly therefrom, one member adjacent each of the corners thereof, each of said members being spaced equidistantly inwardly from the adjacent pair of edges defining the corner, and



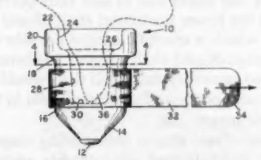
(E) four female interlock members engageable with the male members of an abutting block of equal size and recessed into each of the remaining wall faces, one member adjacent each of the corners thereof, each of said female interlock members being spaced equidistantly inwardly from the edges of the faces by the same distance said male interlock members are spaced inwardly from the edges and being of a depth sufficient to receive the length of a male member.

4,129,961

SPINNING TOP AND BELT

Arnold E. Parodi, 1950 NW. 85th Way, Pembroke Pines, Fla. 33024

Filed Jun. 8, 1977, Ser. No. 804,503
Int. Cl.[2] A63H *1/00*
U.S. Cl. 46—64 **3 Claims**



1. A spinning top and flat flexible belt in combination comprising:

a spinning top comprising a cone-shaped bottom surface merging into a top convex spinning bottom surface, said cone-shaped bottom surface merging into an upwardly extending cylindrical main body portion having a first outer circumference, then merging outwardly and upwardly into a second cylindrical area having a second outer circumference with a radius less than twice the radius of said first outer circumference, said second cylindrical area having inner wall portions approximately coextensive with said second cylindrical area defining a first hollow cylindrical interior having a circumference merging internally into a second hollow interior area being slightly tapered inwardly and having a circumference less than said circumference of said first hollow cylindrical interior and being disposed within the main body cylindrical portion, said first and second hollow interior areas being contoured to receive therewithin a rod or a human finger; and

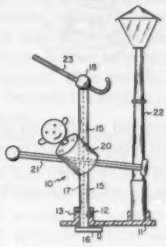
a flat flexible belt means having a width approximately the height of said main body cylindrical portion for being overlappingly wrapped around the main body cylindrical portion and pulling to provide rotation to the spinning top.

4,129,962

DEVICE ADAPTED FOR SELF-DETERMINING, UNPREDICTABLE VARIATIONS IN MOVEMENT

Richard Goldner, 3717 Toad Lake Rd., Bellingham, Wash. 98225

Filed Sep. 22, 1976, Ser. No. 725,465
Int. Cl.[2] A63H *13/00*
U.S. Cl. 46—120 **10 Claims**



1. A device for self-determining, unpredictable movement comprising:

a. a base having at least one opening therein;

b. a deformable, flexible member rotatably mounted to and extending from said base, said member being readily deformable and adapted to retain any deformation until a subsequent deformation occurs;

c. means mounted to said base for rotating said deformable, flexible member relative to said base and operably connected to said deformable, flexible member through said opening;

d. a body member mounted on said deformable, flexible member and frictionally engaging at least a portion of said deformable, flexible member so that, when said deformable flexible member is rotated, said body member will rotate therewith if not obstructed but may remain stationary relative thereto if obstructed; and

e. obstruction means mounted to said base and positioned in the path of rotation of said deformable, flexible member or said body member to deform said deformable, flexible member.

4,129,963

TOY ARTICLE HAVING CHANGEABLE EXPRESSION GRAPHICS

Francis V. Perry, Jr., Foxboro, Mass.; Richard P. Barlik, Cumberland, R.I.; William P. Richardson, South Easton, Mass.; Robert H. Hudson, Seekonk, Mass., and Leonard Gray, South Attleboro, Mass., assignors to Hasbro Development Corp., Pawtucket, R.I.

Filed Sep. 2, 1977, Ser. No. 830,350
Int. Cl.[2] A63H *1/22*
U.S. Cl. 46—155 **10 Claims**

1. A toy article comprising a base having a rounded bottom wall in which a cavity is defined and including an upwardly extending flange that defines the uppermost portion of said base, a central tubular section having a portion thereof that has an upwardly reducing diameter, the lowermost portion of said central section engaging a flange of said base, a portion of said central section being opaque and a portion thereof being clear to provide for visual access therethrough, an interior band

located within said central section and having graphic material imprinted thereon that is visible when the clear portion of said central section is aligned therewith, a top portion having a shaft that extends downwardly through the interior of said central section for engagement with said base for assembling

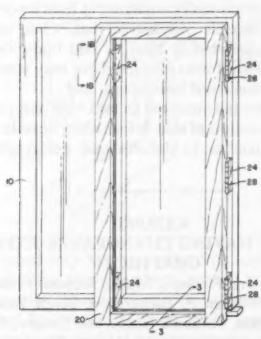
the base, central section and top portion as a unit, said central section being moveable relative to said base and top portion to selectively locate a part of said graphic material in alignment with the clear portion of said central section for visual access thereto.

4,129,964

DOUBLE WINDOW HAVING IMPROVED WEATHER SEALED VENTILATION

Lee E. Farr, 1940 Broadway #5, San Francisco, Calif. 94109

Filed Nov. 25, 1977, Ser. No. 854,958
Int. Cl.[2] E05B *65/04*
U.S. Cl. 49—67 **7 Claims**



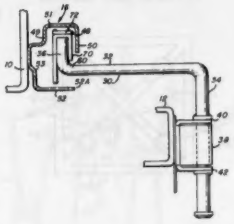
1. A double window comprising in combination a conventional window at least a portion of which is capable of being opened to admit air; a confronting pane of transparent material overlying said portion of said conventional window that is capable of being opened; and, means for maintaining said confronting pane in a plane that is parallel to the plane in which said conventional window lies and exterior the structure of which said conventional window is a part, such that a gap between said conventional window and said confronting pane exists at the entire periphery of said confronting pane, said gap being in the range between 1.5 and 2.25 inches.

4,129,965

SAFETY CRANK ASSEMBLY FOR RAILROAD BOX CAR PLUG-TYPE DOORS

Clarke Reynolds, 16 St. Bernard La., Tiburon, Calif. 94920, and Richard J. Quigley, 25538 Adobe La., Los Altos Hills, Calif. 94022

Filed Mar. 13, 1978, Ser. No. 885,485
Int. Cl.[2] E05D *15/10*
U.S. Cl. 49—220 **11 Claims**



1. For a plug-type railroad box car door which is supported for movement in and out of a door opening in the car by means of a pair of spaced apart operating crank assembly means higher lower operating crank assemblies for engaging a roller track and upper operating crank assemblies for engaging a retainer track having an upper U-shaped channel and a lower horizontal shelf, the improvement of a safety crank assembly mounted between said door, intermediary of said operating crank assembly, and said retainer track to prevent said door from disengaging from the car in the event of failure of said operating crank assembly means, said safety crank assembly comprising;

a crank arm having a substantially horizontal center portion and two oppositely extending vertical end portions;

door means for rotatably securing one vertical end portion of said crank arm to said door;

shuttle means rotatably engaging the other vertical end portion of said crank arm for slidingly supporting said other vertical end portion within said retainer track;

said shuttle means including a rearwardly positioned and downwardly depending load bearing skirt having a length selected such that, in case of failure of said operative crank assemblies, the lower end of said skirt bears on the upper surface to the lower horizontal shelf of said retainer track at a point which is spaced closer to the side wall of the car than the edge of said shelf to exert a substantially smaller bending movement on said shelf than would be exerted by the horizontal portion of said crank arm in the absence of said shuttle means; and

the upper end of said shuttle means being shaped and dimensioned to slidingly and nonrotatably engage the upper U-shaped channel of said retainer track to maintain said skirt in substantially the same rearward position independent of the rotational position of said crank arm.

4,129,966

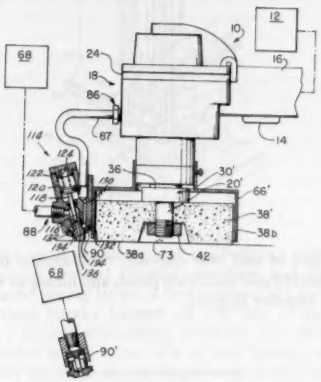
GRINDER APPARATUS WITH POLLUTION CONTROL FLUID DISPENSING MEANS

William L. Smart, Indianapolis, Ind.; Stuart A. Hoenig, Tucson, Ariz.; Christian W. Savitz, Tucson, Ariz., and Douglas K. Darlington, Tucson, Ariz., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Aug. 25, 1977, Ser. No. 827,459
Int. Cl.[2] B24B *23/02, 55/02*
U.S. Cl. 51—170 T **5 Claims**

1. A hand-held grinder comprising a housing, a pneumatic motor housed within the housing, handle means provided on the housing for holding the grinder, means for connecting the motor to a source of compressed gas, and grinding means driven by the motor, the grinding means being connected to an

output shaft of the motor and including a grinding surface, a source of pollution control fluid, means for atomizing the pollution control fluid and for dispensing the pollution control fluid adjacent the grinding surface to capture particulate contaminants generated during grinding operations, means for coupling the atomizing means to the source of pollution control fluid, the motor including an exhaust port and means for coupling the exhaust port to the atomizing means, gas from the source being passed through the pneumatic motor at a first superatmospheric pressure to cause rotation of the shaft, then exhausted from the motor at a second, relatively lower superatmospheric pressure to control dispensing of the pollution control fluid in the atomizing means.

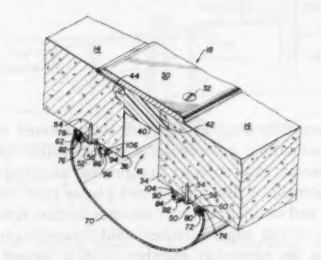


4,129,967

APPARATUS FOR COLLECTING FLUID SEEPAGE IN A BUILDING STRUCTURE

Robert M. Barlow, Great Falls, Va., assignor to John D. VanWagoner, a part interest

Filed Jun. 10, 1977, Ser. No. 805,318
Int. Cl.[2] E04D *13/04;* E04B *1/68*
U.S. Cl. 52—15 **8 Claims**



1. Apparatus for collecting fluid seepage in a building structure or the like wherein said structure is constructed, at least in part, with generally horizontal slabs having separations therein such as expansion joints and/or stress developed cracks which occasionally permit fluid seepage through said slabs, said apparatus comprising:

a first elongated barrier strip means operably positioned completely beneath a bottom surface of a generally horizontal slab along one edge of a separation therein;

mounting means connected to said first barrier strip means for fixedly connecting said first barrier strip to the bottom surface of said slab;

a second elongate barrier strip means operably positioned completely beneath a bottom surface of said generally horizontal slab along the other edge of the separation therein;

mounting means connected to said first barrier strip means for fixedly connecting said second barrier strip to the bottom surface of said slab;

flexible receiving means connected between said first and second elongate barrier strip means and operably extending coextensively with said barrier strip means and beneath the separation in said slab;

said first elongate barrier strip means having,

a first elongate base member operably connected completely beneath the bottom surface of the generally horizontal slab,

a first retaining means fashioned along one edge of said first base member for engaging and holding one edge of said flexible receiving means, and

a first drip contour means fashioned along the other edge of said first base member and being operable to be mounted upon the bottom surface of said slab with said first drip contour means disposed beneath said slab and adjacent one side of the separation in said slab; and

said second elongate barrier strip means having,

a second elongated base member operably connected completely beneath the bottom surface of the generally horizontal slab,

a second retaining means fashioned along one edge of said second base member for engaging and holding the other edge of said flexible receiving means, and

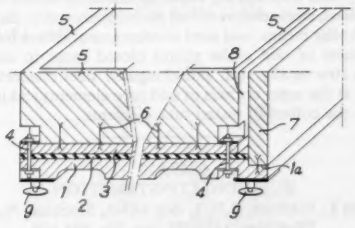
a second drip contour means fashioned along the other edge of said second base member and being operable to be mounted upon the bottom surface of said slab with said second drip countour means disposed beneath said slab and adjacent the other side of the separation in said slab wherein fluid seeping through the separation in said slab will encounter either said first or said second contour means and drip downwardly therefrom into said receiving means.

4,129,968

MODULAR CONSTRUCTION ELEMENT

Fernand Royer, 15 Grand'rue, Sarry, 51000 Chalons sur Marne, France

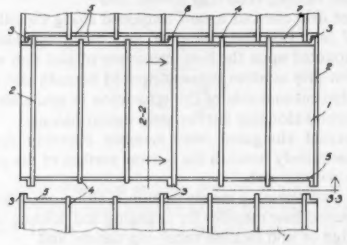
Filed Jun. 21, 1977, Ser. No. 808,443
Claims priority, application France, Jun. 28, 1976, 76 19617
Int. Cl.[2] E04H *1/12;* E04B *1/36*
U.S. Cl. 52—79.1 **16 Claims**



1. A modular element for use in the construction of dwellings comprising, a floor, a ceiling and vertical walls extending between the floor and the ceiling to define at least one parallelepipedic box-shaped compartment, said floor having a plurality of corners and comprising a reinforced concrete slab, a layer of supple material placed on and covering said slab, and a false floor positioned on said supple material for relative movement with respect to said slab, said vertical walls being rigidly connected at their base to said flase floor for movement therewith, and releasable fixing means connected between said slab and said false floor, at least in each of the corners of the element, for selectively fixing the slab to the false floor when the element is in its final position in use and for permitting

limited relative movement therebetween when the element is being transported to a construction site whereby excess loads imposed on the floor slab during transport are absorbed in said supple material without being transmitted to said false floor or said vertical walls.

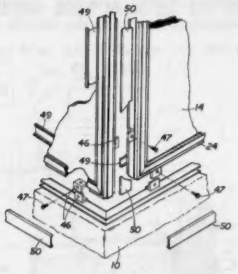
4,129,969
STRUCTURAL SPACE ELEMENT
Jalo Haapala, Temppelikatu 8 A 23, Helsinki, Finland
Filed Jun. 15, 1976, Ser. No. 696,333
Claims priority, application Finland, Jun. 27, 1975, 751913; Nov. 17, 1975, 753231
Int. Cl.[2] E04B 5/48; E04C 1/30
U.S. Cl. 52—79.9 **10 Claims**



1. A building structure comprising a plurality of mated spaced elements, each of said space elements comprising a tube element having two generally vertical walls along with a generally horizontal floor and ceiling, each of said tube elements having a longitudinal axis, each of said tube elements having collar means transversely circumscribing the outside of the respective tube element at fixed intervals to define beam-pillar-rings, said collar means having vertical pillar portions disposed along said two vertical walls and horizontal beam portions disposed along said general horizontal floor and ceiling, said pillar portions having a cross-sectional area greater than said beam portions, said tube element being mated such that the collar means of one tube element mates with the collar means of the other tube elements, said tube elements being mated side-by-side and one upon and beneath the other by inverting one tube element end-to-end relative to an adjacent tube element such that the collar means on one tube element overlaps with the collar means on the other mating tube element, whereby said overlapping collar means form double overlapping collars, steel reinforcement means anchored in the corners of said collar means, said steel reinforcement means forming at the corners of said collar means closed loops to make said corners structurally stiff, and elongated steel concrete means located at the outer corners of said tube elements and interconnecting the collars of mated tube elements.

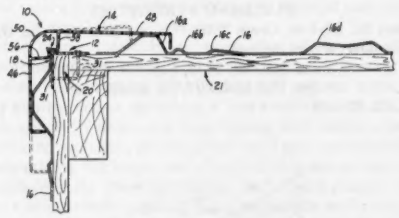
4,129,970
BUILDING CONSTRUCTION
Franklyn L. Whitney, R.D. 1, Box 447-A, Stockton, N.J. 08559
Filed Nov. 14, 1977, Ser. No. 851,160
Int. Cl.[2] E04B 2/08
U.S. Cl. 52—285 **12 Claims**

1. In a building unit having a plurality of panels interconnected to comprise a building module, a sandwich panel having a pair of spaced parallel surface sheets and an intermediate filler material, and a reinforcing, load-carrying framing element extending about the periphery of said sandwich panel, said framing element comprising an elongated member of generally U-shaped cross-section having spaced parallel extending leg portions and an intermediate transverse leg portion, each of said three leg portions having a wide base portion, and a flange portion mounted in outwardly-spaced-parallel relation to said base portion by a pedestal, the width of said pedestal being less than the width of said flange portion to provide clearance between the inner side of each free margin of the flange and the outer side of the base portion confronting said flange, the extending leg portions being mounted with the



inner surface of said base disposed flush against the exposed surface sheet of said sandwich panel, and means to anchor said U-shaped member in place.

4,129,971
EDGE COVER TRIM
Hans E. Reusser, Westlake, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio
Filed Apr. 29, 1977, Ser. No. 792,256
Int. Cl.[2] E04B 5/00, 7/00
U.S. Cl. 52—288 **6 Claims**

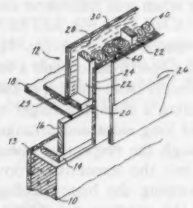


1. Corner trim structure for use with formed metal sheet roofing and siding, comprising a snap together support and resilient cover; said support comprising an elongated angle member formed of first and second planar parts meeting at a first apex, and an integral cover-retainer portion along the apex externally of the angle member, said cover-retainer portion comprising an elongated member with a second apex and diverging surfaces that terminate in flange-like marginal portions that define side edges extending longitudinally of the angle member, the second apex, marginal portions and side edges being spaced from the planar parts of the angle member; and said cover comprising first and second elongated sides, the general extents of which form an acute included angle therebetween, a portion along the distal edge of each side extending inwardly of the included angle, and first and second retaining elements extending inwardly of the included angle from the first and second sides, respectively, of the cover, each retaining element terminating along its distal edge in a portion that fits between one of the planar parts of the angle member and the overlying flange-like marginal portion of the cover-retainer portion of the support, when the cover and support are assembled.

4,129,972
TOP VENTED INSULATING STRUCTURE

Morton Sherman, and James A. Berry, both of St. Petersburg, Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Feb. 8, 1977, Ser. No. 766,649
Int. Cl.[2] E04B *1/70*
U.S. Cl. 52—303 15 Claims

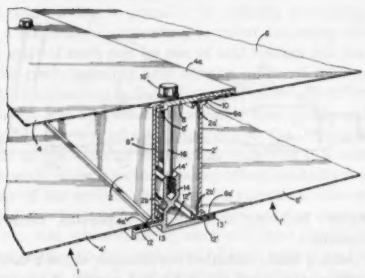


1. A top-vented, insulating wall in a building structure comprising spaced vertical framing members and interior and exterior face-forming layers, a first substantially moisture- and air-impervious barrier located on one side of said framing members, a second substantially moisture- and air-impervious barrier located on the other side of said framing members, a substantially moisture- and air-impervious closure substantially sealing said barriers at the bottom of said wall and a venting structure located only at the top of said wall to permit release of water vapor from the interior of said wall.

4,129,973
JOINING CLAMP ASSEMBLY WITH OVERLAPPING SEALS FOR TRANSLUCENT WALL PANELS AND THE LIKE

Richard R. Keller, Bedford, N.H., assignor to Kalwall Corporation, Manchester, N.H.

Filed May 4, 1977, Ser. No. 793,522
Int. Cl.[2] E04B *7/00;* E04D *1/16, 3/38*
U.S. Cl. 52—308 4 Claims

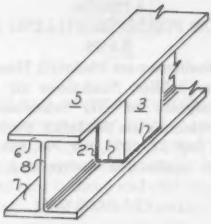


1. An overlapping panel structure comprising, in combination, first and second sandwich type panels having longitudinal peripheral portions positioned in edge-to-edge relation and carrying sheets of material on opposed surfaces thereof, and a clamp assembly, said clamp assembly comprising opposed first and second longitudinally extending clamping structures, the first clamping structure being permanently fixed to the first panel and having a member extending from the peripheral portion of the first panel, said member overlapping an adjacent sheet of the second panel and staggering the second panel out of the plane of the first panel, the second clamping structure having oppositely directed members and being assembled with said panels so that said oppositely directed members overlap adjacent sheets of the first and second panels, respectively, said oppositely directed members being offset to accommodate said staggering of the panels, recesses being provided between each of said members and the sheets overlapped thereby, said recesses receiving weather-sealing means therein contacting the corresponding overlapped sheets, locking means connected with the second clamping structure and extending in the space between the clamping structures, and securing means passed from the first clamping structure into said space, engaging the locking means, and drawing said clamping structures together and clamping said panels therebetween.

4,129,974
WARP-RESTRAINING DEVICE AND IMPROVEMENT TO BEAMS, GIRDERS, ARCH RIBS, COLUMNS AND STRUTS

Morris Ojalvo, 2258 Wickliffe Rd., Columbus, Ohio 43221

Filed Jun. 18, 1974, Ser. No. 480,513
Int. Cl.[2] E04C *3/06*
U.S. Cl. 52—729 3 Claims

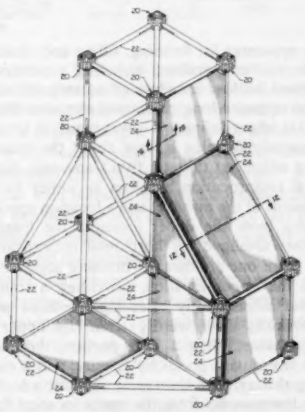


2. An improved structural member comprising:
At least two substantially parallel flanges;
At least one rectangular web interconnecting said flanges;
At least one element having the shape of a trough with open ends positioned between an opposing pair of said flanges with the end edges of said element connected in a continuous or substantially continuous manner to the inner faces of said flanges and with said longitudinal edges of said element in contact with and connected to the web in a continuous or substantially continuous manner.

4,129,975
CONSTRUCTION SET HAVING CLIP FASTENERS

Richard J. Gabriel, Portland, Oreg., assignor to Matrix Toys, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 775,916, Mar. 9, 1977, abandoned. This application Oct. 19, 1977, Ser. No. 843,580
Int. Cl.[2] E04H *12/10*
U.S. Cl. 52—648 6 Claims



1. A construction set for forming three-dimensional models comprising:

(a) hollow joint elements having multiple joint openings located therein, some of said joint openings being circular and some of said joint openings being elongate with substantially straight parallel sides and arcuate ends having a diameter equal to the diameter of said circular joint openings;

(b) elongate struts adapted for interconnecting two of said joint elements, each strut having a clip located at each end, said clip being generally cylindrical in cross section with truncated side walls, for snug releasable joinder with said elongate joint openings when properly aligned therewith and rotatable joinder with said circular openings; and

(c) the clips being elastically depressable for insertion into the joint openings, and having means for interlocking with the joint elements upon return to their relaxed positions when seated in the openings.

4,129,976

APPARATUS FOR FORMING, FILLING AND CLOSING BAGS

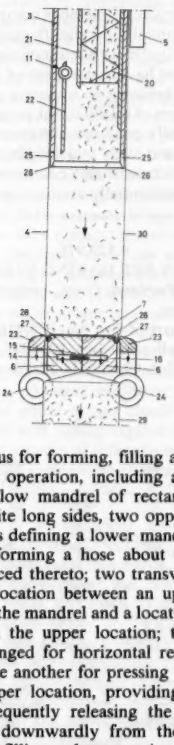
Bruno Gründler, Neuhausen am Rheinfall; Hans Heinzer, Beringen, and Werner Müller, Neuhausen am Rheinfall, all of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Sep. 21, 1977, Ser. No. 835,426

Claims priority, application Switzerland, Sep. 30, 1976, 12370/76

Int. Cl.[2] B65B *9/12*

U.S. Cl. 53—552 **6 Claims**



1. In an apparatus for forming, filling and closing bags in a continuous, cyclic operation, including a substantially vertically oriented hollow mandrel of rectangular cross section having two opposite long sides, two opposite short sides and low terminal edges defining a lower mandrel terminus; means for continuously forming a hose about the mandrel from a sheet being advanced thereto; two transverse shoes arranged for vertical reciprocation between an upper location at the lower terminus of the mandrel and a location spaced vertically downwardly from the upper location; the transverse shoes being further arranged for horizontal reciprocation towards and away from one another for pressing together a first hose portion in the upper location, providing a transverse seam thereon and subsequently releasing the hose at a location spaced vertically downwardly from the upper location; a dispensing device filling a hose portion, terminating at the transverse seam, with goods by gravity; and a cutting device for cutting through the transverse seam at a location spaced vertically downwardly from the upper location for severing a filled and sealed hose portion, constituting a bag, from the hose; the improvement comprising

(a) folding means for engaging, at said upper location, opposite sides of a second hose portion situated immediately above the first hose portion for forming inwardly oriented bottom flaps of the second hose portion;

(b) means defining openings provided in said long sides of said mandrel in the vicinity of said terminal edges;

(c) means defining grooves provided in said transverse shoes; said grooves being in alignment with a respective said opening when said transverse shoes are in said upper location;

(d) clamping means arranged for vertical reciprocation between said upper location and a location spaced vertically downwardly from said upper location; said clamping means including a clamping finger arranged laterally of either of said long sides and arranged to be movable to project through the respective opening in said mandrel and engage into the respective groove in said transverse shoe for clamping the hose thereagainst; the clamping fingers and the grooves constituting means for firmly grasping the hose at the bottom flaps thereof and pulling downwardly said hose upon movement of said clamping means and said transverse shoes downwardly from said upper location; and

(e) backup means arranged for vertical reciprocation between said upper location and a location spaced vertically downwardly from said upper location for maintaining said bottom flaps in a spread-out state along the entire cross section of the hose during the downward movement of said clamping means.

4,129,977

LOW SPEED ROTARY MOWER

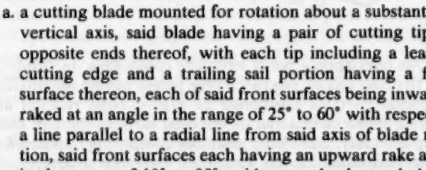
Robert C. Comer, Hopkins, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Aug. 2, 1974, Ser. No. 494,167

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.[2] A01D *35/262*

U.S. Cl. 56—13.4 **12 Claims**



1. Rotary mowing and bagging apparatus, comprising, in combination:

a. a cutting blade mounted for rotation about a substantially vertical axis, said blade having a pair of cutting tips at opposite ends thereof, with each tip including a leading cutting edge and a trailing sail portion having a front surface thereon, each of said front surfaces being inwardly raked at an angle in the range of 25° to 60° with respect to a line parallel to a radial line from said axis of blade rotation, said front surfaces each having an upward rake angle in the range of 18° to 35°, said upward rake angle being defined as the angle between said front surface and a line perpendicular to a cutting plane defined by rotation of said cutting edges about said axis;

b. a mower housing in which said blade is mounted, having an expansion portion with an expansion top wall with a substantial rise therein leading to a discharge opening, said housing also having a continuous exterior side wall surrounding said blade at the height thereof and extending above said sail portions;

c. means for rotatably driving said blade at a tip speed in the range of 5,000 FPM–14,000 FPM;

d. front and rear wheels mounted on said housing to enable movement of said mower over a ground surface at a controlled height thereabove; and

e. a grass-catching bag attached to said housing at said discharge opening.

4,129,978

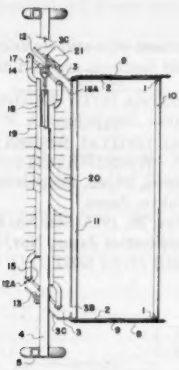
HARVESTER SWATH PICKUP

David Friesen, Box 154, Plum Coulee, Manitoba, Canada

Continuation-in-part of Ser. No. 640,887, Dec. 15, 1975, abandoned. This application Jan. 23, 1978, Ser. No. 871,705

Int. Cl.[2] A01D *89/00*

U.S. Cl. 56—364 **2 Claims**



1. In a grain pickup for attachment to a harvester which includes a transverse frame bar and a source of power, said pickup being supported within said frame bar, said pickup comprising in combination a pair of spaced and parallel spiders journalled for rotation one upon each end of said frame bar and operatively connected to said source of power for rotation thereby, said spiders being inclined at an angle to the direction of travel and having a plurality of radially extending arms thereon, a transversely extending member extending between the outer ends of each arm on one of said spiders and the outer end of the corresponding arm on the other of said spiders, pickup teeth extending radially from the outer side of each of said members and universal joint means operatively connecting each end of each of said members to the corresponding outer ends of the arms of the spiders to which it is attached, said outer ends of each member being offset inwardly from the outer ends of the spiders, towards the rotational axis of each spider, said members and said teeth reciprocating transversely of said frame bar, when rotating, each universal joint including a block journalled to the outer end of each arm of said spider, each offset outer end of said member including a forked end pivotally connected to the associated block.

4,129,979

APPARATUS FOR TWISTING A YARN

Edmund Hamel, Romanshorn, Switzerland, assignor to Evolution S.A., Rorschach, Switzerland

Filed Mar. 7, 1977, Ser. No. 775,404

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609758; Jul. 6, 1976, 2630357

Int. Cl.[2] D01H *1/16, 1/42, 7/82*

U.S. Cl. 57—59 **17 Claims**

1. A device for twisting a yarn, comprising:

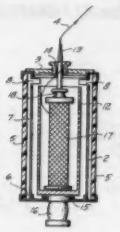
a spindle adapted to receive a supply spool of a yarn to be twisted and rotatable about an axis;

means for rotating said spindle about said axis;

a can surrounding said spindle and a spool adapted to be carried thereby and coupled with said spindle for rotation therewith about said axis;

a stationary housing closely surrounding said can; and

a closure member on at least one axial end of said housing reaching inwardly toward said axis and closing the space between said housing and said can at said one end to reduce power consumption in the twisting of a yarn paid off from said spool and emerging from said can and said housing at and end thereof, said axis being generally upright and said yarn emerging from the upper end of said can, said closure member being a cover displaceably mounted upon said housing, formed with an opening traversed by said yarn, and openable to afford access to the interior of said housing and said can, said can and said housing being cylindrical and coaxial with one another and said cover being a circular disk, said opening being provided at the center of said disk.



4,129,980

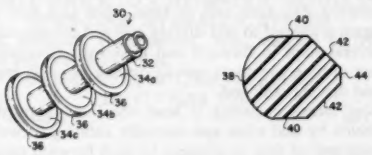
FRICTION DISCS FOR FALSE-TWIST HEAD

Roy E. Dillon, Stoneville, N.C., assignor to Macfield Texturing, Inc., Madison, N.C.

Filed Jan. 18, 1978, Ser. No. 870,374

Int. Cl.[2] D02G *1/04*

U.S. Cl. 57—339 **5 Claims**



1. In a friction- or false-twist head construction of the type having a plurality of rotatably mounted spindles, each carrying a plurality of friction discs which overlap and through which head a thread is passed along a zig-zag path between the spindles and over the bearing edges of the friction discs, the improvement whereby the friction discs comprise:

(a) a circular base member having means associated therewith for mounting of said base on one of said spindles;

(b) said base member including an inwardly extending groove around the periphery thereof;

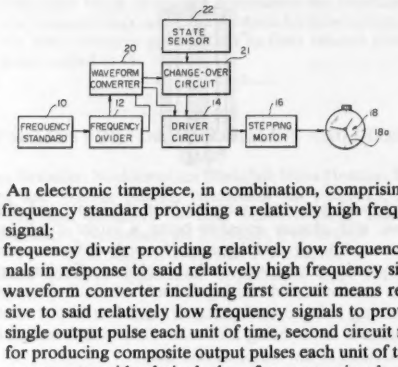
(c) a separate, ring-shaped member formed of a resilient material having a relatively high coeffecient of friction and also having a radially extending interior protrusion of such size and shape as to be releasably snap-fit into said groove in said base member;

(d) whereby no other securing technique is necessary to hold the ring-shape member on said base member and when worn out may be easily replaced, thereby repeatedly utilizing the same base member with a plurality of successively usable ring-shaped members.

4,129,981
ELECTRONIC TIMEPIECE

Yasushi Nomura, Tokorozawa; Fumio Nakajima, Tokyo; Kenji Yamada, Koganei, and Takayasu Machida, Iruma, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Feb. 2, 1977, Ser. No. 764,790
Claims priority, application Japan, Feb. 6, 1976, 51-11973; Feb. 9, 1976, 51-13093
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—23 D **6 Claims**



1. An electronic timepiece, in combination, comprising:
a frequency standard providing a relatively high frequency signal;
a frequency divier providing relatively low frequency signals in response to said relatively high frequency signals;
a waveform converter including first circuit means responsive to said relatively low frequency signals to provide a single output pulse each unit of time, second circuit means for producing composite output pulses each unit of time in response to said relatively low frequency signals which composite output pulses are delayed in phase from said single output pulse, and synthesizing circuit means for providing a synthesized signal composed of said single output pulse and said composite output pulses appearing each unit of time;
a driver circuit for producing a first drive signal composed of said single output pulses each unit of time and a second driving signal composed of said synthesized signal;
means for selectively rendering said second circuit means operative in dependence on an operational state of the timepiece;
a reversible stepping motor including a driving coil, a rotor, and a stator including means for driving said rotor in a forward step each unit of time when said first driving signal is applied to said driving coil and driving said rotor several steps in forward and backward directions each unit of time when said second driving signal is applied to said driving coil; and
display means including at least one hand adapted to be driven by said rotor and normally rotating forward step each unit of time in response to each forward rotation of said rotor, to indicate time data, while rotating several steps in forward and backward directions in response to each forward and backward rotation of said rotor, to indicate said operational state of the timepiece.

4,129,982
MERCURY SWITCH ARRANGEMENT FOR DIGITAL WATCH

Virgil de la Cruz, 67 Byram Shore Rd., Greenwich, Conn. 06830

Filed Mar. 8, 1977, Ser. No. 775,448
Int. Cl.[2] G04C *3/00*; G04B *19/24*
U.S. Cl. 58—23 R **14 Claims**

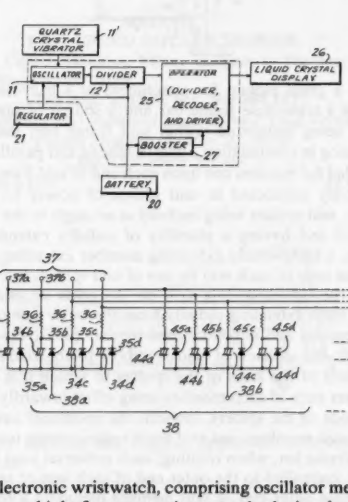
1. In a digital wrist watch a watch housing, a display means in said housing, a mercury switch for automatically activating the various display circuits for the functions of the digital watch, said mercury switch including a curved tube having a droplet of mercury therein, means for moving said curved tube to a limited degree in a curved plane to thereby adjust for individual viewing angles of said digital wrist watch, and electrical contacts in predetermined location in said tube whereby when the wearer of the wrist watch raises and turns his hand and forearm to a normal viewing position, said mercury droplet, in response to a gravitational pull, moves to a

position into engagement with said electrical contacts thereby activating one of said functions and said display means.

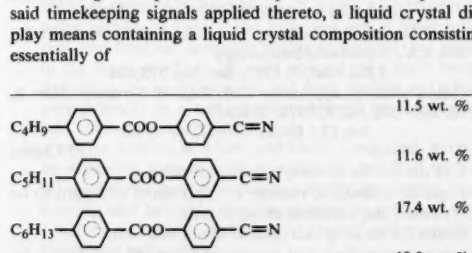
4,129,983
LIQUID CRYSTAL DIGITAL DISPLAY ELECTRONIC WRISTWATCH

Yoshio Yamazaki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 20, 1975, Ser. No. 633,734
Claims priority, application Japan, Nov. 21, 1974, 49-133920
Int. Cl.[2] G04B *19/30*; G02F *1/13*; C09K *3/34*
U.S. Cl. 58—50 R **1 Claim**



1. An electronic wristwatch, comprising oscillator means for producing a high frequency time standard signal, divider means for producing low frequency signals in response to said high frequency standard signal, decoder means for producing decoded signals representative of present time in response to said timekeeping signals applied thereto, a liquid crystal display means containing a liquid crystal composition consisting essentially of



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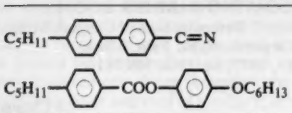


except for minor quantities of impurities, and driver means for driving said liquid crystal display means to display present time in response to said decoder signals being applied thereto, said oscillator means, divider means, decoder means, liquid crystal display means and driver means being operable by a single electrochemical cell power source without booster circuitry, said single electrochemical cell power source having a voltage of about 1.5V.

4,129,984

GAS TURBINE ENGINE WITH ANTI-ICING FACILITY

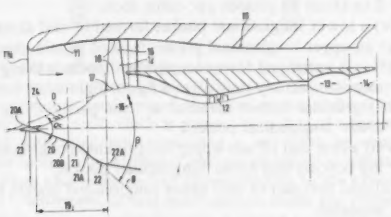
Michael E. Nelson, N. Avon, England, assignor to Rolls-Royce Limited, London, England

Filed May 25, 1977, Ser. No. 800,327

Claims priority, application United Kingdom, Jun. 1, 1976, 22510/76

Int. Cl.[2] F02C *7/04*; B04C *11/14*

U.S. Cl. 60—39.09 D **6 Claims**



1. Gas turbine engine comprising an air intake duct, a compressor duct, a compressor having a rotor hub defining the radially inner surface of the compressor duct, the hub having at the upstream end thereof a nose whereby, in operation, to divide a stream of air entering the intake duct and spreading said stream outwardly toward said hub surface, said nose being secured to said hub and being rotatable therewith, said nose comprising an upstream part having a conical surface defining a pointed upstream end and a circular downstream end whose diameter is substantially less than that of said hub, said nose further comprising an intermediate part defining a concave surface of revolution contiguous with the upstream part and a downstream part defining a convex surface of revolution arranged contiguously between the intermediate part and said hub.

4,129,985

COMBUSTOR DEVICE OF GAS TURBINE ENGINE

Shinichi Kajita, Kobe; Kenji Mori, Ashiya, and Junichi Kitajima, Minoo, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

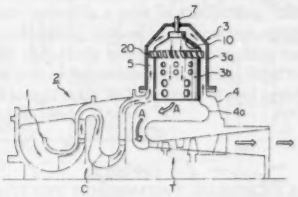
Filed Nov. 9, 1976, Ser. No. 739,863

Claims priority, application Japan, Nov. 17, 1975, 50/156614[U]; May 8, 1976, 51/52530

Int. Cl.[2] F02C *7/18*

U.S. Cl. 60—39.37 **8 Claims**

1. In a combustor device for a gas turbine engine having a compressor for supplying compressed air into the combustor device and a turbine driven by combustion gas from the combustor device, said combustor device comprising a cylindrical outer casing having a closed axial end and an open axial end, a cylindrical inner casing coaxially provided in the outer casing to define between the outer and inner casings an annular passage for taking therein the compressed air from the compressor, said inner casing defining therein a combustion chamber and having in one axial end thereof facing the closed axial end of the outer casing a swirler opening which is coaxial with said outer and inner casings and through which the compressed air in the annular passage flows into the combustion chamber, said outer and inner casings being disposed in such a manner that the common axis of the casings extends substantially transverse to the rotational axis of the turbine, and fuel injection means for injecting fuel into the combustion chamber:



the improvement comprising a number of swirl preventing vanes fixedly provided in the space between said outer and inner casings, each of said swirl preventing vanes having a tangentially sloping upstream portion and an axially extending downstream portion to eliminate or reduce swirling motion of the compressed air around said swirler opening thereby to prevent static pressure drop of the compressed air at the inlet of the swirling opening.

4,129,986

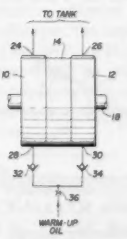
METHOD OF AND MEANS FOR PREVENTING THERMAL SHOCK TO A HYDRAULIC MOTOR IN AN OPEN-LOOP HYDRAULIC SYSTEM

Allan E. Heinrich, Oconomowoc, Wis., assignor to Dynex/-Rivett Inc., Pewaukee, Wis.

Filed Jul. 13, 1977, Ser. No. 815,455

Int. Cl.[2] F15B *21/04*

U.S. Cl. 60—327 **10 Claims**

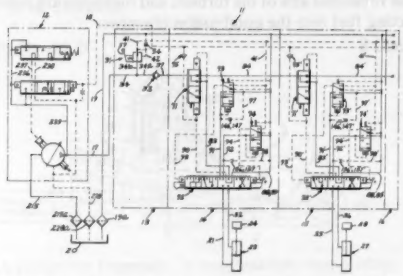


1. A method of preventing thermal shock to a hydraulic vane motor in an open-loop hydraulic system comprising a tank, a pump, at least one directional control valve, and the hydraulic vane motor, said hydraulic vane motor comprising a cam and motor housing containing a rotor mounted on a shaft, said housing having end cover portions, said method comprising the step of continuously circulating warm oil from a source of consistently warm oil through the end cover portions of the hydraulic vane motor when it is not in use.

4,129,987
HYDRAULIC CONTROL SYSTEM

Nicholas C. Blume, Spring Lake Park, Minn., assignor to Gresen Manufacturing Company, Minneapolis, Minn.

Filed Oct. 17, 1977, Ser. No. 842,453
Int. Cl.[2] F15B 11/16; F16H 39/46
U.S. Cl. 60—445 6 Claims

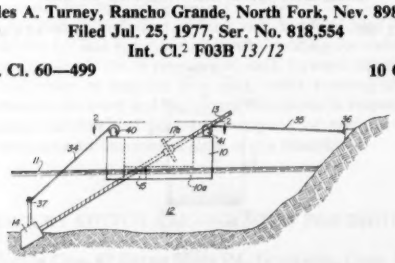


1. Hydraulic control apparatus comprising:
(a) a plurality of valve control sections each of which comprises
(i) a valve body defining an inlet adapted for connection to variable output pumping means, at least one work port adapted for connection to a hydraulically actuated device, and a signal pressure outlet;
(ii) power spool means for selectively blocking and establishing fluid communication under variable pressure between the inlet and the associated work port;
(iii) a signal pressure chamber;
(iv) control means for establishing fluid communication between the work port and signal pressure chamber when the power spool means connects the inlet to the work port;
(v) and check valve means constructed and arranged to permit the flow of hydraulic fluid only from the signal pressure chamber to the signal pressure outlet;
(b) the signal pressure outlets of the respective valve sections being commonly connected to define a signal pressure line for transmitting the largest of the plurality of signal pressures.

4,129,988
TIDAL POWER PLANT OR THE LIKE

Sayles A. Turney, Rancho Grande, North Fork, Nev. 89801

Filed Jul. 25, 1977, Ser. No. 818,554
Int. Cl.[2] F03B 13/12
U.S. Cl. 60—499 10 Claims

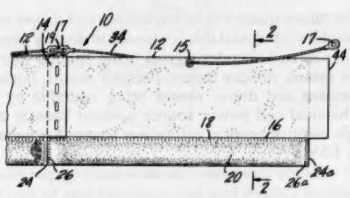


1. Apparatus for obtaining energy from a body of water whose surface level varies with time, comprising a buoyant body adapted to float in the water and to rise and fall with variations in the surface level of the water; at least one stationary shaft extending freely from securement adjacent to an end or ends thereof and obliquely through at least a portion of the depth of the body of water that comprehends the variations in surface level; means encircling said shaft and interconnecting the buoyant body therewith for movement longitudinally therealong; and means for converting into rotational energy the longitudinal travel of the buoyant body along the shaft as such buoyant body rises and falls with variations in water level.

4,129,989
BALLASTED FLOATING BARRIER BOOM

Ilmer I. Niemi, and Kenneth S. Peterson, both of Cloquet, Minn., assignors to Conwed Corporation, St. Paul, Minn.

Filed Apr. 19, 1977, Ser. No. 788,761
Int. Cl.[2] E02B 15/04
U.S. Cl. 405—70 15 Claims

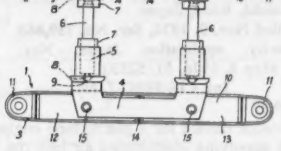


1. A boom for containing pollutants floating on water comprising:
(a) at least two boom elements;
(b) each of said at least two boom elements comprising:
(i) a sheet of flexible buoyant polyethylene foam material;
(ii) said polyethylene foam having a thickness of from about ⅛ to about 1 inch;
(iii) said polyethylene foam having a density of from about 2 to about 10 pounds per cubic foot;
(iv) a lower longitudinal pocket formed in said sheet;
(v) an upper longitudinal pocket formed in said sheet;
(vi) said upper and lower longitudinal pockets being continuous whereby they form a figure-eight cross section;
(vii) granular ballast material at least partly filling said lower longitudinal pocket;
(viii) a first end of said upper longitudinal pocket extending beyond said lower longitudinal pocket;
(ix) said first end of said upper longitudinal pocket being unsealed;
(c) the second end of a first boom element being fitted into said unsealed first end of a second boom element;
(d) means attaching said first and second ends in their fitted relationship.

4,129,990
ADVANCING SUPPORT

Alfred Valantin, Clermont, France, assignor to Charbonnages de France, Paris, France

Filed Jan. 25, 1977, Ser. No. 762,798
Claims priority, application France, Jan. 26, 1976, 76 01961
Int. Cl.[2] E02D 15/44
U.S. Cl. 405—299 12 Claims



1. An advancing support for providing a continuous propping and comprising at least two carriages for articulated tracks, each of said carriages including a beam having rounded ends and an articulated track closely surrounding the beam mounted for sliding friction on the beam, each of said carriages

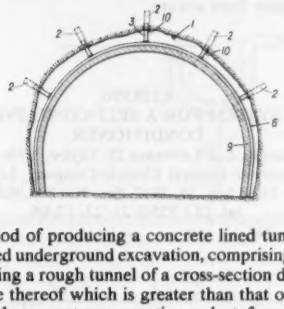
extending along a longitudinal axis, each beam having at least two longitudinal elements spaced-apart in end to end relation along said longitudinal axis, a connecting element pivotally attached to each of said longitudinal elements of a said beam for joining said longitudinal elements together, said carriages being disposed one above the other to be applied respectively against the floor and roof of a gallery; at least one jack attached to the connecting element of the upper carriage and the connecting element of the lower carriage thereby joining said carriages together.

4,129,991

METHOD OF PRODUCING A CONCRETE LINED TUNNEL OR OTHER UNDERGROUND EXCAVATION

Karl Schaden, Hameaustrasse 59, Wien 19, Austria

Filed Oct. 28, 1977, Ser. No. 846,522
Int. Cl.² E21D *11/15*
U.S. Cl. 405—150 **7 Claims**



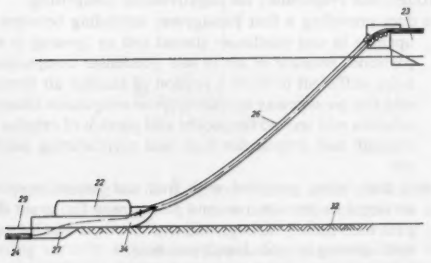
1. A method of producing a concrete lined tunnel or other concrete lined underground excavation, comprising the steps of first excavating a rough tunnel of a cross-section defined by an inner surface thereof which is greater than that of a tunnel to be lined with concrete; connecting a lost form by support members to the inner surface of said rough tunnel at a distance spaced from said inner surface corresponding to the expected maximum settlement of said inner surface under the influence of the rock pressure acting thereon; applying a concrete lining to a surface of said lost form facing away from said inner surface; and making the rigidity of said support members relative to the rock pressure smaller than the rigidity of the concrete lining so that said support members may yield during the settlement of said rough tunnel.

4,129,992

LAYING TOOL FOR LAYING OF SUBMARINE CABLES INTO A SEA-BOTTOM

Stig T. Carlsson, Spånga; Bo M. Rasmusson, Handen, and Viktor Scuka, Upplands Bälinge, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Apr. 20, 1977, Ser. No. 789,148
Claims priority, application Sweden, May 3, 1976, 7605035
Int. Cl.² E02F *5/02*
U.S. Cl. 405—164 **23 Claims**



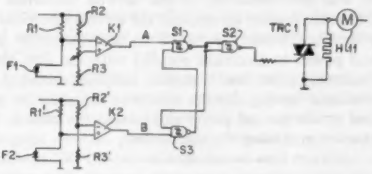
1. A tool for laying submarine cables comprising a drag unit for dragging along the sea-bottom and a pulling vessel, the drag unit comprising a body and a ploughing means supported by the body for ploughing a trench in a sea or ocean bottom, a pulling tube on said drag unit for guiding submarine cables from the pulling vessel to said drag unit and down into said trench, the underside surface of the body being substantially planar and having at the rear end of the body a central notch in the central part of which said ploughing means is disposed, said ploughing means being shaped as a keel the front part of which is in the form of two ploughs, inclusive of an upper broad plough and a lower narrow plough, the lower plough being placed behind the upper plough, said body having an inner part which occupies a part of the pulling tube which opens into the ploughing means somewhat spaced from the very back of the ploughing means, said ploughing means further comprising a stern frame having a leading edge extending from said notch in said body past the front of said upper plough to the front of said lower plough.

4,129,993

REFRIGERATION EQUIPMENT, PARTICULARLY HOUSEHOLD REFRIGERATION OR THE LIKE

Henno Schotten, Giengen, Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Germany

Filed Mar. 29, 1977, Ser. No. 782,403
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616175
Int. Cl.² F25D *21/00*
U.S. Cl. 62—156 **3 Claims**



1. In refrigeration equipment, particularly household refrigerator or the like, with a heat-insulated refrigation chamber having a heat exchanger for cooling, and a refrigation unit which is switched-on imtermittently by a temperature-dependent control, and the heat exchanger of which, arranged in the refrigeration chamber, is defrosted between the cooling periods through the supply of heat by thermal energy and natural incidence of heat from the environment of the refrigeration equipment, the control being equipped with two sensors with switching functions one sensor of which measures the air temperature in the refrigeration chamber and the other, the temperature at the heat exchanger, the improvement comprising coupling the switching functions of the sensors by a mutually interlocking electronic circuit in which the switching function actuated by the temperature at one sensor must run down completely before the switching function actuated at the other sensor is set in motion.

4,129,994

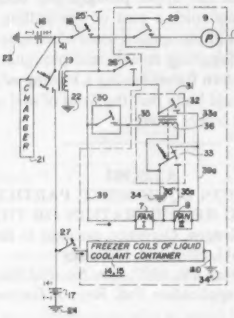
INSTANT-COOLING ICE-MAKER AIR CONDITIONER

Paul H. Y. Ku, 47-50 59th St./Apt. 6E, Woodside, N.Y. 11377

Filed Oct. 18, 1976, Ser. No. 733,090
Int. Cl.² F25D *17/02*
U.S. Cl. 62—179 **10 Claims**

1. An ice-making air-conditioner device comprising in combination: a coolant vessel; an air-cooling structure forming a partial enclosure with inlet and outlet ports; coolant conducts mounted to circulate coolant from the coolant vessel through space of the partial enclosure of the air-cooling structure, and back to the coolant vessel; a pump connected to pump and circulate coolant through said coolant conduits; freezer means for freezing coolant when provided with electrical power, the

freezer means including freezer coils within the coolant vessel; fan means for circulating air into the inlet port through space of the partial enclosure and out of the outlet port of the coolant vessel; circuitry means for providing electrical power and switches for the pump, the freezer means, and the fan means, and for providing interconnected circuitry therefor such that ice is formed from the coolant during perods of non-use of the pump; and two separate first and second electrical power sources interconnected by said circuitry means, the first electrical power source having circuitry adapted to provide electrical power to the freezer means during at-least periods of non-use and disconnection of the second electrical power source from the freezer means, and the second electrical power source having circuitry adapted to intermittently provide electrical power in electrical parallel with the first electrical power source, to the freezer means, and the second electrical power source having further circuitry adapted to provide electrical power to said pump and to said fan means, the circuitry means providing the circuitries.



4,129,995

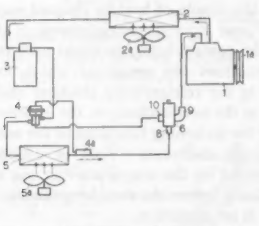
EVAPORATION PRESSURE CONTROL DEVICE

Kiyoshi Usami, Ohbu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 9, 1977, Ser. No. 767,147

Int. Cl.[2] F25B *41/04;* **B60H** *3/04;* **F16K** *31/12, 31/36*

U.S. Cl. 62—217 **6 Claims**



1. An air conditioning system for an automotive vehicle comprising:

a compressor operatively coupled to and driven by an internal combustion engine for compressing refrigerant;

a condensor connected to said compressor for cooling and condensing the compressed refrigerant;

a receiver connected to said condensor for storing the condensed refrigerant;

an expansion valve connected to said receiver for expanding the refrigerant flowing therethrough,

said expansion valve also controlling the amount of the refrigerant flowing therethrough;

an evaporator connected to said expansion valve for evaporating the refrigerant therein to thereby cool the air passing through the evaporator;

temperature sensing means disposed on an outlet side of said evaporator for detecting the temperature of the refrigerant out of said evaporator and also for actuating said expansion valve to control the amount of the refrigerant flowing to said evaporator in response to the detected temperature; and

an evaporation pressure control device connected between said evaporator and said compressor for detecting the pressure of the refrigerant out of said evaporator and also actuating said expansion valve to control the amount of the refrigerant flowing to said evaporator in response to the detected pressure in addition to the flow control of the refrigerant in response to the temperature of the refrigerant by said temperature sensing means,

said evaporation pressure control device being responsive to an extreme decrease of the pressure of the refrigerant out of said evaporator as an indication of leakage of the refrigerant, in order to return the refrigerant to said compressor, when said leakage occurs, to thereby prevent said compressor from seizure.

4,129,996

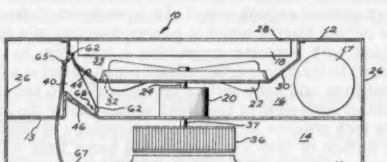
VENT SYSTEM FOR A SELF-CONTAINED AIR CONDITIONER

Louis W. Hardin, and Lawrence D. Taylor, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Sep. 19, 1977, Ser. No. 834,562

Int. Cl.[2] F25D *23/12, 17/06*

U.S. Cl. 62—262 **7 Claims**



1. In a self-contained air conditioning unit, including a housing, a partition within said housing dividing said housing into interior and exterior chambers; a condenser disposed within said exterior chamber adjacent an outlet in said casing and said evaporator being disposed in said interior chamber; a condenser shroud member including an opening forming a condenser compartment; a fan in said opening to pass exterior air between an inlet in said housing through said condenser to said outlet and for compressing air in said condenser compartment; a second fan in said interior chamber to recirculate interior air through said evaporator, the improvement comprising:

a duct providing a first passageway extending between an opening in said condenser shroud and an opening in said partition, pressure of air in said condenser compartment being sufficient to force a portion of exterior air through said first passageway into the interior evaporator chamber wherein said second fan moves said portion of exterior air through said evaporator with said recirculating interior air;

said duct being provided with first and second openings arranged to provide a second passageway for an air flow path transversely through said duct between said inlet and said opening in said shroud member;

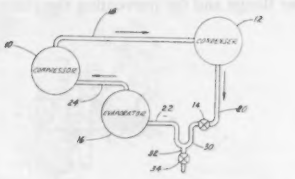
air directional control means associated with said duct including air valve means movably arranged relative to said passageways for alternatively permitting air flow through said first or second passageway.

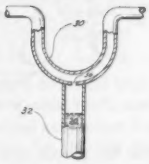
4,129,997

PERMANENT REFRIGERANT DEHYDRATOR

Robert J. Kunkle, c/o Lyle J. Schlyer Attorney at Law, 20951 Brookhurst, Suite 3, Huntington Beach, Calif. 92646

Filed Aug. 12, 1977, Ser. No. 824,079
Int. Cl.[2] F25B *43/04*
U.S. Cl. 62—475 9 Claims





1. A refrigerant dehydrator, in combination with a refrigeration system of the type including a compressor, a condenser, a refrigerant expansion device, and an evaporator, comprising:

a body member, generally describing a U-shape configuration, the body member incorporating walls surrounding and describing a refrigerant conducting bore operationally interposed between said refrigerant expansion device and said evaporator;

a sump member incorporating walls surrounding and describing a bore, the sump member communicating with the lower portion of the body member and extending downward therefrom such that the bore of the body member communicates with the bore of the sump member; and

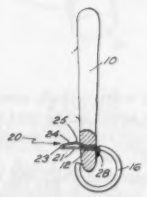
A drain valve sealably connected to the lower portion of the sump member whereby water accumulated in the sump member may be drained therefrom.

4,129,998

EARRING

Nicholas J. Ferro, Johnston, R.I., assignor to Ferro Novelty Company, Inc., Johnston, R.I.

Filed Jun. 7, 1977, Ser. No. 804,301
Int. Cl.[2] A44C *7/00*
U.S. Cl. 63—12 4 Claims



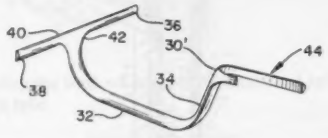
1. In an earring the combination with an ornament therefor of an ear attaching means for mounting such ornament on the outer side of a pierced ear lobe and including means for increasing security against accidental disengagement from the ear, said attaching means comprising a first straight rigid member having one end fixed to such ornament and extending therefrom and an acutely bent back arm over said straight rigid member with a portion rising away from said member, then bent abruptly toward said rigid member crossing the same and terminating at a point therebeyond, said attaching means thus providing a hump at a location between said acute bend and the point of attachment of said member to said ornament and of a distance from said acute bend to pass thru said piercing in the ear lobe and engage the inner side thereof, said straight member and bent back arm being resiliently compressible toward each other upon forcing the same through the ear lobe piercing in either direction, said termination point being at a location to be exterior to the earlobe piercing when the earring is in mounted condition.

4,129,999

RING GUARD ATTACHABLE BY MELTING END PORTIONS THEREOF

George W. Shelton, 5131-C Roadrunner Land, Austin, Tex. 78749

Filed Jan. 17, 1977, Ser. No. 760,097
Int. Cl.[2] A44C *9/02*
U.S. Cl. 63—15.6 2 Claims



1. A guard for a finger ring, said guard being of unitary construction and including a finger-engaging mid-section (32), opposed socket-forming members and opposed marginal end portions (34);

said opposed marginal end portions being joined to said mid-section, and upwardly curving away therefrom;

each of said opposed socket-forming members having a marginal central portion and including two transverse members (36, 38) joined together at said marginal central portion with the two transverse members each having a free end portion which is directed away from said mid-section;

said marginal central portion being joined to the end of said marginal end portion which is remote from said mid-section;

said guard being of a size to be positioned with the mid-section thereof located within a finger ring while each of the transverse members lies adjacent one of opposed lengths of the ring shank therewithin, and each pair of said transverse members being adapted to be wrapped about the shank and melted into the form of the aforesaid socket such that the socket slidably captures opposed marginal lengths of the shank therewithin.

4,130,000

DRILL STRING SHOCK ABSORBER

Edward V. Burge, Houston, Tex., assignor to Richard Dean Hawn, Jr., Dallas, Tex.

Filed Sep. 20, 1976, Ser. No. 724,541
Int. Cl.[2] F16D *3/06;* E21B *17/04;* F16F *9/18*
U.S. Cl. 64—1 V 6 Claims

1. A shock absorber for a drill string including a tubular housing adapted to be connected in a drill string adjacent its lower end,

a tubular mandrel slidably mounted in the tubular housing and projecting from its lower end,

upper and lower spaced packing means mounted on and surrounding the mandrel for sealing off between said housing and mandrel and forming therebetween an upper annular chamber in said housing,

means below the lower packing means for slidably and drivingly connecting said mandrel to said housing for rotation therewith,

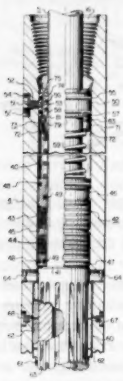
the upper housing chamber containing a noncompressible fluid for cushioning relative reciprocation between said mandrel and housing,

flow control means mounted in said upper chamber between the upper and lower packing means for controlling the flow of the fluid upon said relative reciprocation and for restricting upward flow of said fluid from below to above the flow control means so as to resist upward reciprocation of said mandrel relative to said housing,

said lower packing means being slidably confined upon said mandrel,

said restriction of upward fluid flow upon relative upward reciprocation of said mandrel creating fluid pressure between said flow control means and lower packing means for urging the latter downwardly away from said flow control means so as to permit limited upward reciprocal movement of said mandrel relative to said lower packing means,

sealing means in the lower end portion of said housing for



packing off between the lower portions of said mandrel and housing below the means for slidably and drivingly connecting said mandrel to said housing,

the sealing means coacting with said lower packing means to form a lower annular chamber therebetween of sufficient length to enclose said slidably and drivingly connecting means and adapted to contain a fluid lubricant therefor,

said tubular housing having a bore in its upper portion complementary in diameter to said upper packing means and forming at least a portion of said upper annular chamber of said housing,

said upper packing means being confined upon the upper end portion of said tubular mandrel in slidably engagement with the bore in the upper portion of said housing,

said housing having a bore in its lower portion complementary in diameter to said lower packing means and forming at least a portion of said upper annular housing chamber,

said lower packing means being in coacting slidable engagement with the bore in the lower portion of said housing as well as the exterior of said mandrel.

4,130,001

DRIVE COUPLER AND UNCOUPLER

Frank Woodruff, New Hartford, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Aug. 25, 1977, Ser. No. 827,500
Int. Cl.[2] F16D *3/54, 19/00, 11/06*
U.S. Cl. 64—19 **7 Claims**

1. A drive coupler and uncoupler comprising:

a driving member including a flange;

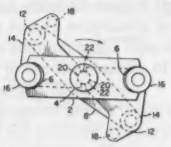
a driven member including a flange, said flange carrying a pair of pivots;

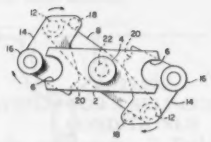
a pair of plates, each of which is supported by a corresponding pivot;

first means arranged with the plates and the driving member flange for engaging said plates and flange;

displaceable second means;

the plates including means engaged with the second means for maintaining the engagement of the plates and driving member flange and for preventing the plates from pivot-





ing about the pivots, and to thereby couple the driving and driven members; and

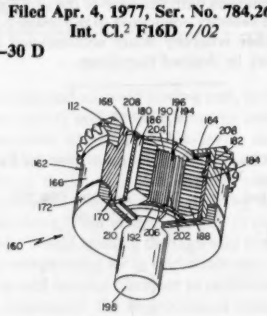
the second means displaced for being disengaged from the means included in the plates, with the driving action between the driving and driven members pivoting the plates about the pivots so that the first means disengages the plates and driving member flange to uncouple the driving and driven members.

4,130,002

SLIP COUPLING

Jonathon H. Katz, Brookline, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Apr. 4, 1977, Ser. No. 784,267
Int. Cl.[2] F16D *7/02*
U.S. Cl. 64—30 D **8 Claims**



1. A slip coupling for a drive shaft, comprising

outer coupling means surrounding said shaft,

radially expandable inner coupling means between said outer means and said shaft, and

resilient means between said shaft and said inner coupling means to press the latter into frictional engagement with said outer means while providing rotational flexibility between said shaft and said inner coupling means to thereby provide isolation from torsional vibration,

wherein said inner coupling means comprises a plurality of separate members, and

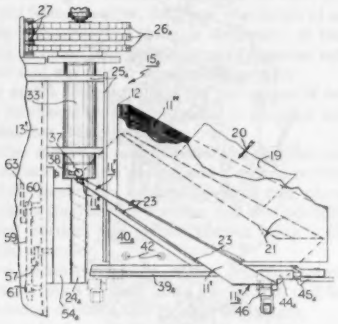
wherein said inner coupling means is split along angularly spaced lines to provide said separate members, and said resilient means comprises a plurality of members angularly aligned with said separate members.

4,130,003

APPARATUS FOR MANUFACTURING HELICAL COILS

Maxwell S. Campbell, P.O. Box 134, Elkins, N.H. 03233

Filed Jun. 24, 1977, Ser. No. 809,926
Int. Cl.[2] B21F 3/04, 3/10
U.S. Cl. 72—133 11 Claims



1. Apparatus for the manufacture of helical coils from substantially straight discrete blanks of metal stock, comprising an arbor rotatable about its longitudinal axis, means for clamping one end of a blank to said arbor for rotation thereby in a skewed relationship therewith, said clamping means being mounted for rotation with said arbor about said axis, and said clamping means including a clamp member disposed on the outside of said arbor and actuatable to move from a first position at which it does not interfere with placement of the said one end of a blank against said arbor to a second position at which it overlies the said one end of a blank placed against said arbor and thence to a third position at which it clamps the said one end of a blank tightly against said arbor, means for locking the other end of a blank against motion in the longitudinal direction of said axis and angularly about said axis while allowing movement of said other end in a radial direction relative to said axis, means for rotating said arbor and clamping means about said axis, and means holding said locking means in a fixed angular relation about said axis, whereby rotation of said arbor about said axis causes a blank clamped thereto to become wrapped helically about said arbor with pitch as determined by the positioning and holding of the blank relative to said arbor by said clamping means and locking means.

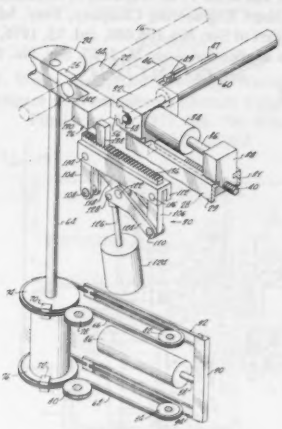
4,130,004

METHOD FOR BENDING TUBES

Homer L. Eaton, Balboa, Calif., assignor to Eaton-Leonard Corporation, Santa Ana, Calif.

Division of Ser. No. 692,585, Jun. 3, 1976, Pat. No. 4,063,441, which is a continuation-in-part of Ser. No. 614,946, Sep. 19, 1975, abandoned. This application Aug. 18, 1977, Ser. No. 825,554
Int. Cl.[2] B21D 7/04
U.S. Cl. 72—151 22 Claims

1. A method of bending tubes comprising the steps of starting a bend without applying substantial axial tension to the tube to thereby partially wrap the tube around a bend die to provide an increased area of contact between the tube and die and to provide an increased force holding the tube against the bend die, and



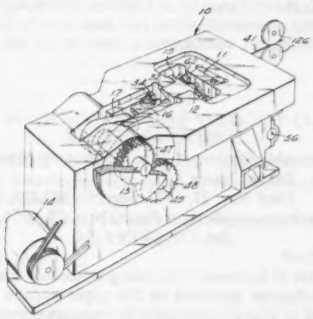
completing the bend while applying substantial axial tension to the tube.

4,130,005

HIGH SPEED BALL HEADER

Allan D. Haines, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Continuation-in-part of Ser. No. 699,892, Jun. 25, 1976. This application Aug. 15, 1977, Ser. No. 824,927
Int. Cl.[2] B21D 72/00
U.S. Cl. 72—360 8 Claims

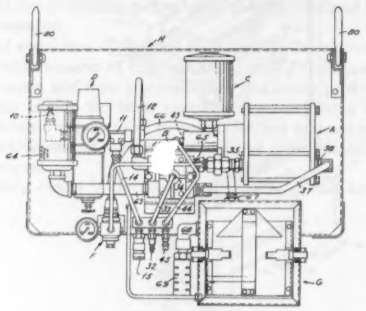


1. A cold former comprising a frame, a pair of dies mounted on said frame for relative movement between a retracted position spaced from each other to allow positioning of a workpiece between said dies and a closed forward position to deform such workpiece to a required shape; power means operable to move said dies from said retracted position to an intermediate gripping position so that such workpiece is initially gripped while said dies are moving relative to each other with a first relative velocity and to thereafter move said dies from said gripping position to said closed position with an initial second relative velocity which is substantially greater than said first relative velocity, said first relative velocity being sufficiently lower than said second velocity to substantially reduce the rate of errosion of said dies below the rate which would occur if said workpiece were initially gripped by said dies moving at said second velocity.

4,130,006
RIVETING SYSTEM

Robert J. Ebbert, and John V. Brown, both of Rochester, Mich., assignors to Ebbert Engineering Company, Troy, Mich.

Continuation-in-part of Ser. No. 105,686, Jul. 15, 1976, Pat. No. 4,062,217. This application Aug. 25, 1977, Ser. No. 827,793
Int. Cl.[2] B21J *15/34*
U.S. Cl. 72—391 4 Claims



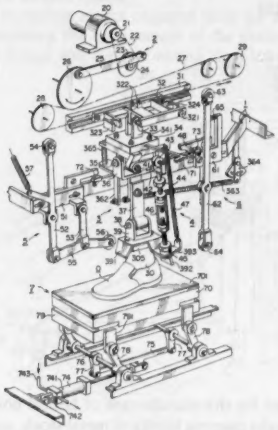
1. A riveting system comprising a power operated rivet setting tool having a housing, a nose piece fixed on said housing for receiving a rivet with an attached mandrel projecting within said housing, power actuated means within said housing including mandrel gripping jaws adapted to engage and retract said mandrel to effect the setting of a rivet in a workpiece and separation of its mandrel, means for returning said jaws to an advanced open position releasing said mandrel, tubular means extending from said mandrel gripping jaws to a mandrel collecting receptacle remote from said housing, vacuum means for producing an air flow through said tubular means effective upon release of said mandrel for conducting said mandrel to said collecting receptacle, and an air passage means communicating with the entrance to said tubular means bypassing any rivet mandrel positioned within said nose piece to minimize air flow restriction for conducting a mandrel to said collecting receptacle.

4,130,007
FOOTWEAR TESTER

Hideki Hayashi, Kurume, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1977, Ser. No. 853,891
Claims priority, application Japan, Nov. 25, 1976, 51-140722
Int. Cl.[2] G01N *3/56*
U.S. Cl. 73—7 10 Claims

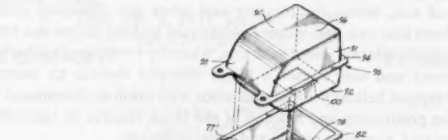
1. A tester of footwear comprising a machine stand, a prime mover mechanism mounted on the upper portion of the machine stand to give reciprocative movements repeatedly in the longitudinal direction of said footwear, a supporting mechanism for supporting freely a footwear block for attachment of said footwear so that the footwear block can be advanced and retreated and can be bent in all directions, a footwear block inclining mechanism attached to the footwear block supporting mechanism to slightly incline the footwear block in the lateral direction of said footwear only when the footwear block supporting mechanism is retreated, a front operation mechanism disposed in the machine stand to incline forwardly the posture of the footwear block when the footwear block supporting mechanism is located in the vicinity of the front dead point, a rear operation mechanism disposed in the machine stand to incline backwardly the posture of the footwear block when the footwear block supporting mechanism is located in the vicinity of the rear dead point and a lift mechanism for bringing up and down a ground stand so that the ground stand is in the brought-down state during a period from the point when the footwear block supporting mechanism is advanced to the front dead point to the point when the footwear block supporting mechanism is retreated to a point intermediate the front dead point and the rear dead point, wherin when the tester is driven, the respective mechanisms are interconnected with each other so that longitudinal inclination, lateral inclination, grounding operation and kick-up operation resembling those imparted to the foot during practical walking are given to the footwear block.



4,130,008
DEVICE FOR MEASURING FRICTION AND DISTANCE

Robert W. Broshears, Rte. 1, Box 1437, Bremerton, Wash. 98310

Filed Feb. 3, 1978, Ser. No. 874,884
Int. Cl.[2] G01N *19/02*
U.S. Cl. 73—9 15 Claims



1. A device for measuring coefficient of friction comprising:
a test pad of material, the coefficient of friction of which is to be measured on a given surface;
a test pad holder for holding said test pad in contact with said surface;
a frame upon which said test pad holder is slidably and removably mounted, said frame having a longitudinal dimension and a transverse dimension, said test pad holder being free to slide on said frame along the longitudinal dimension of said frame, said frame including a pair of elongate first frame members in parallel spaced relation and extending in said longitudinal dimension of said frame, each of said first frame members having a first end and a second end and further including an elongate second

frame member transverse to said first frame members and attached to a first end of each of said first frame members;

container means adapted to fit inside said test pad holder, said container means having an aperture therein through which a fill material can be placed into said container means to increase the weight of said container means to a predetermined magnitude;

at least one wheel rotatably mounted on each end of said second frame member, the plane of rotation of said wheel being normal to the elongate dimension of said second frame member, said wheels being of diameter sufficient to allow said test pad to engage said surface;

handle means for controlling the movement of said frame, said handle means being attached to a second end of each of said first frame members;

a chamber affixed to said second frame member, said chamber including a first portion and a second portion;

a flexible diaphragm, mounted within said chamber and forming a fluid barrier between said first portion and said second portion, said second portion being a closed hydraulic chamber;

a piston slidably mounted within said first portion, said piston having a first end and a second end, said first end of said piston abutting said flexible diaphragm;

an actuator having a first end and a second end, said first end of said actuator being affixed to said second end of said piston and said second end of said actuator abutting said test pad holder such that motion of said test pad holder relative to said frame along the longitudinal dimension of said frame in the direction away from the handle means causes said test pad holder to move said actuator which in turn moves said piston so as to cause an increase in pressure in said second portion; and,

gauge means for indicating the magnitude of pressure within said second portion.

4,130,009

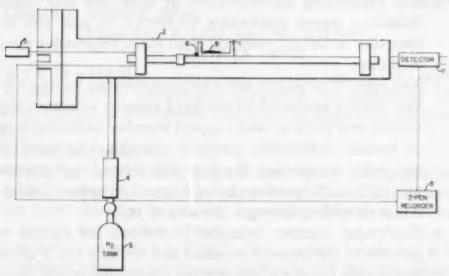
METHOD AND APPARATUS FOR DETERMINING THERMOPARTICULATION TEMPERATURE OF COMPOUNDS

James D. B. Smith, Turtle Creek, and David C. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 669,554, Mar. 23, 1976, Pat. No. 4,102,809, which is a division of Ser. No. 390,284, Aug. 21, 1973, Pat. No. 3,973,438. This application Feb. 16, 1977, Ser. No. 769,130

Int. Cl.[2] G01N *25/02*

U.S. Cl. 73—17 R **14 Claims**



1. A method of determining the thermoparticulating temperature of a compound which thermoparticulates at a temperature below 230° C. comprising

(1) mixing about 20 to about 250 phr of said compound into a liquid resin which is unreactive with said compound and which is solidifiable and stable at the thermoparticulating temperature of said compound;

(2) solidifying said resin;

(3) providing a flow of gas over said mixture;

(4) monitoring said gas for the presence of particles therein;

(5) gradually heating said mixture; and

(6) noting the temperature of said mixture when said monitor detects particles in said gas.

4,130,010

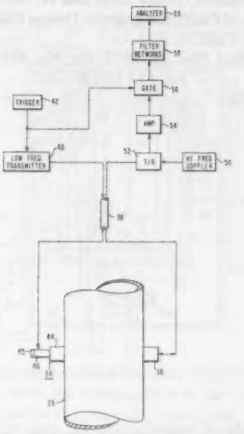
BUBBLE DETECTOR

James W. Wonn, Hempfield Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 15, 1977, Ser. No. 824,593

Int. Cl.[2] G01N *29/02*

U.S. Cl. 73—19 **9 Claims**



1. Apparatus for detecting bubbles in a liquid subject to inclusion of solid acoustic energy scatterers, comprising:

(A) a relatively low frequency acoustic generation system operable to project acoustic energy into a region of said liquid to insonify it with standing waves;

(B) a relatively higher frequency acoustic motion detection system operable to detect motion of bubbles in said region displaced due to said low frequency insonification.

4,130,011

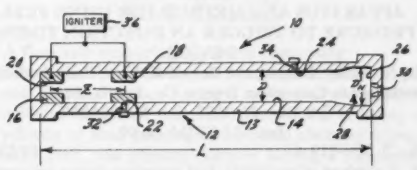
FLARED SONIC END NOZZLE VELOCITY COUPLING TEST BURNER

Paul L. Micheli, Sacramento, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,437

Int. Cl.[2] G01N *33/22*

U.S. Cl. 73—35 **9 Claims**



1. A velocity coupling test burner comprising an elongated body, said body having walls which define a chamber formed within said body, said chamber being closed at one end thereof and having a flared nozzle formed at the other end thereof, said flared nozzle terminating in a centrally located opening, a propellant driver located within said chamber adjacent the closed end thereof, first and second transducers located within said walls of said body, each of said transducers being capable

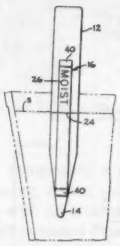
of operably attaching a propellent sample thereto, and means operably connected to said driver and said sample for igniting said driver and said sample, whereby upon ignition of said propellant driver and said propellant sample the velocity coupling response can be measured.

4,130,012

SOIL MOISTURE INDICATOR

Charles E. Lockerby, Foster City, and W. Scott Dimmick, Sunnyvale, both of Calif., assignors to Design Loft Creations, Inc., Foster City, Calif.

Filed Nov. 25, 1977, Ser. No. 854,794
Int. Cl.[2] G01N *5/02*
U.S. Cl. 73—73 **4 Claims**



1. An article of manufacture for indicating the moisture content of a plant growing medium comprising an elongate rigid base member having sufficient strength for penetration into the surface of said medium, an elongate water absorbent sheet having length and width dimensions less than corresponding dimensions of said base member, a transparent impervious layer laminated to one surface of said sheet, said layer having a width substantially equal to that of the sheet and a length greater than the length of the sheet so as to form an incremental portion of at least one longitudinal end of said sheet that extends beyond said sheet, means for adhesively securing said sheet and said incremental portion to said base member so that said layer overlies said sheet, and a region of said water absorbent sheet remote from said incremental portion being treated to produce a visual effect when said sheet is wet different from that produced when dry.

4,130,013

APPARATUS AND METHOD FOR USING FUEL PRESSURE TO TRIGGER AN INJECTION TIMING DEVICE

John M. Bailey, Dunlap, and Ronald K. Scott, Buda, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 27, 1977, Ser. No. 864,997
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 A **12 Claims**

1. A method of providing fuel injection timing information to set the timing of an engine, comprising:

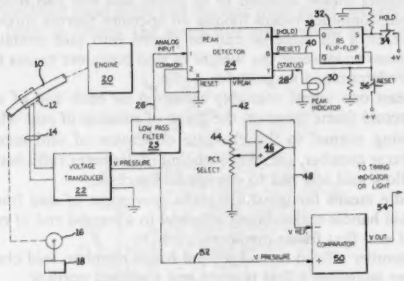
(a) running the engine under a certain condition;

(b) sensing the pressure of fuel in a fuel line with a pressure sensing means;

(c) generating a first variable amplitude output signal with said pressure sensing means, said first signal having fuel pressure information;

(d) generating a second signal proportional to a peak amplitude of said first variable signal;

(e) comparing said second signal with said first variable signal; and



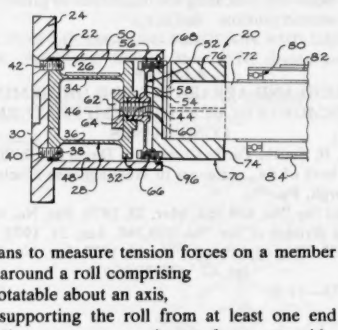
(f) generating a third signal when said first signal is at least equal to said second signal to produce the timing information.

4,130,014

TENSION MONITOR MEANS

Gerald R. Eddens, St. Louis, Mo., assignor to W. J. Industries, Incorporated, St. Louis, Mo.

Filed Oct. 11, 1977, Ser. No. 840,646
Int. Cl.[2] G01L *5/10*
U.S. Cl. 73—144 **20 Claims**



12. Means to measure tension forces on a member moving over and around a roll comprising

a roll rotatable about an axis,

means supporting the roll from at least one end thereof including means responsive to forces on said roll in a direction to deflect said roll, said force responsive means including

a fixed support structure and a support member having a first end portion anchored to the fixed support structure and a second end portion, said support member including a pair of spaced deflectable portions extending between and integrally connecting the first and second end portions, said deflectable portions being located on opposite sides of a line extending through the axis of roll,

a diaphragm member interposed between the second end portion of the support member and the one roll end, said diaphragm having a hub portion connected to the second end portion and a rim portion outwardly therefrom,

means connecting the rim portion to the said one roll end,

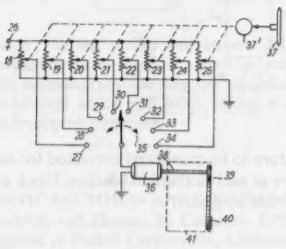
means on said fixed support structure engageable by the second end portion of said support member and by the rim portion of the diaphragm when the roll is under predetermined tension force to limit the amount of possible deflection of said support member, and

sensor means attached to at least one of said pair of deflectable portions at a location to indicate the deflection thereof.

4,130,015
SAFE TAKE-OFF INDICATORS

John H. H. Grover, Ashford, England, assignor to National Research Development Corporation, London, England

Filed Feb. 8, 1977, Ser. No. 766,643
Claims priority, application United Kingdom, Feb. 9, 1976, 4984/76
Int. Cl.[2] G01C *21/10*
U.S. Cl. 73—178 T 10 Claims



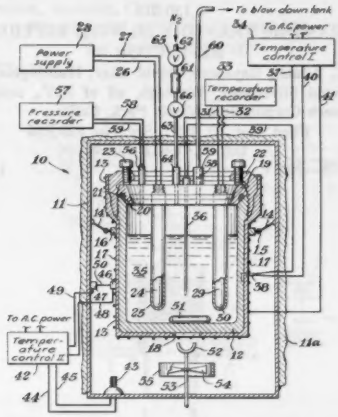
1. A take-off performance indicator system, comprising:
means electrically defining a plurality of different speed versus distance curves;
means actuable for selecting a desired one of the said curves in dependence upon parameters relevant to an individual take-off;
means for generating a first electrical signal dependent upon distance traversed by the aircraft during a take-off run;
means for applying said first electrical signal to said curve-defining means to generate a second electrical signal representative of the speed associated in the selected curve with the distance defined by the first signal; and
means for providing a display dependent upon the second signal, wherein the selecting means is adapted to effect the selection in dependence upon individual take-off parameters and including means responsive to at least one of the said parameters for directly controlling said selecting means in response thereto.

4,130,016
ADIABATIC CALORIMETER APPARATUS AND METHOD FOR MEASURING THE ENERGY CHANGE IN A CHEMICAL REACTION

Lynn C. Walker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1977, Ser. No. 822,595
Int. Cl.[2] G01K *17/00*
U.S. Cl. 73—190 R 16 Claims

1. An adiabatic calorimeter apparatus for measuring the energy change in a chemical reaction, the apparatus comprising:
an oven chamber;
a reaction vessel which is positioned in the oven chamber and is adapted to contain one or more chemical reactants;
the oven chamber containing a gas atmosphere which surrounds the reaction vessel;
a jacket cover which is fitted to the reaction vessel and is in contact with the outer wall surface of the reaction vessel;
a temperature measuring means positioned in the reaction vessel;
a temperature recorder unit which is electrically connected into the temperature measuring means;
a first heater means which is positioned in the reaction vessel;
a second heater means which is attached to an outer wall surface of the jacket cover;
a first temperature control system which includes a first temperature sensor positioned in the reaction vessel, a second temperature sensor attached to the outer wall surface of the reaction vessel, the second heater means, and a first temperature control unit positioned outside of the oven chamber and electrically connected to the first and second temperature sensors and the second heater means;
the first temperature control unit thereby controlling power input to the second heater means on the jacket cover, such

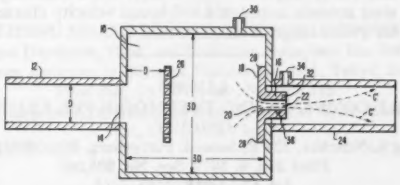


that the temperature of the reaction vessel is maintained in equilibrium with the temperature of the chemical reactants contained in the reaction vessel; and
a stirring means positioned in the reaction vessel and operatively associated with a means for actuating the stirring means.

4,130,017
FLOW RATE MEASURING DEVICE

Robert P. Benedict, Media, Pa., and John S. Wyler, Andover, Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1977, Ser. No. 847,528
Int. Cl.[2] G01F *1/42*
U.S. Cl. 73—211 9 Claims



1. A flow rate measuring apparatus comprising:
a plenum chamber including an inlet port and an outlet port, said plenum chamber having a substantially larger cross-sectional flow area than said inlet port for reducing the velocity of fluid entering said plenum chamber to essentially zero, said plenum chamber having a substantially larger cross-sectional flow area than said outlet port;
a converging nozzle having a body portion with an inlet opening for receiving fluid from said plenum chamber and an outlet opening for expelling that fluid after it has been accelerated through a throat in the body which connecting said inlet and outlet openings, said nozzle being disposed through said plenum outlet port, said nozzle's body portion having an inlet end which bounds said inlet opening, said inlet end being disposed within said plenum chamber and extending a smaller distance in the nozzle's radial direction than does the portion of said plenum

chamber radially adjacent thereto and a greater radial distance than said outlet port; and

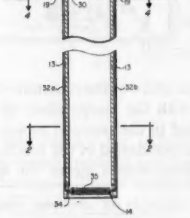
an upstream and a downstream pressure tap, said upstream tap being disposed in said plenum chamber and said downstream tap being disposed downstream from said plenum chamber outlet port.

4,130,018

ULTRASONIC TRANSDUCER WITH REFERENCE REFLECTOR

George L. Adams, Bayshore; David Aker, Huntington Station, and David Silvermetz, Wantagh, all of N.Y., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Aug. 30, 1977, Ser. No. 829,036
Int. Cl.[2] G01F *23/28*
U.S. Cl. 73—290 V **11 Claims**



1. An ultrasonic transducer for transmitting acoustic waves into a gaseous environment comprising:

a. a piezoelectric crystal; and

b. a window layer mounted adjacent said crystal to transmit acoustic waves between said crystal and a gaseous environment, said window layer composed of an acoustically transmissive material having dispersed therein hollow glass spheres having diameters in the range of 20–300 microns so that said window layer has a relatively constant acoustic impedance and sound velocity characteristic over a range of temperatures.

4,130,019

SELF-COMPENSATING THERMOCOUPLE READING CIRCUIT

John S. Nitschke, 324 E. Second, Perrysburg, Ohio 43551

Filed Jun. 9, 1977, Ser. No. 805,067
Int. Cl.[2] G01K *7/10, 7/12*
U.S. Cl. 73—341 **4 Claims**

1. A self-compensating thermocouple reading circuit comprising:

a first thermocouple adapted to sense a temperature to be monitored;

an isothermal junction block at which said first thermocouple is connected to reading circuit conductors;

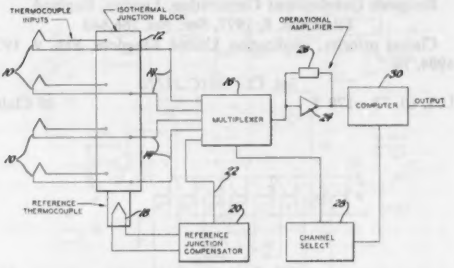
a second thermocouple adapted to sense the temperature of said isothermal junction block;

a reference junction compensator connected to said second thermocouple to effect a compensated connection of said second thermocouple to reading circuit conductors;

an amplifier;

means for selectively connecting either said first thermocouple or said second thermocouple to said amplifier;

and means connected to the output of said amplifier to subtract the signal developed when said second thermocouple is connected to said amplifier from the signal developed when said first thermocouple is connected to said amplifier to thereby generate a signal proportional to the



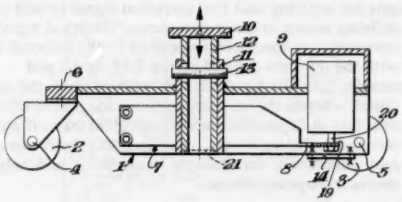
temperature to be monitored corrected for both the junction error at said isothermal junction block and the offset error of said amplifier.

4,130,020

PORTABLE BEARING SUPPORT

Otfrid Maus, Darmstadt, Germany, assignor to Schenck-Auto-Service Geraete GmbH, Darmstadt, Germany

Filed Sep. 13, 1977, Ser. No. 832,832
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 2641890
Int. Cl.[2] G01M *1/28*
U.S. Cl. 73—457 **8 Claims**



1. A portable bearing support for measuring out of balance forces comprising:

(a) a flexible elongated frame having wheel means mounted at each end;

(b) a load receiver mounted on said frame between the ends thereof;

(c) an elongated non-loadbearing pointer arm having one end securely fastened to said frame and having the other end free to move but in communication with a relative type pick-up which is securely mounted on said frame;

whereby the flexure of the frame caused by a load applied to the load receiver causes deflection of the free end of the pointer which deflection is detected and measured by the relative type pick-up.

4,130,021

ULTRASONIC SECTOR SCANNING SEARCH UNIT

Peter G. Mueller, Guilford, and Albert S. Goodrich, Newtown, both of Conn., assignors to Picker Corporation, Cleveland, Ohio

Filed Nov. 12, 1976, Ser. No. 741,413
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—633 **6 Claims**

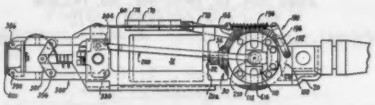
1. An ultrasonic scanner unit, comprising:

(a) a frame;

(b) a transducer;

(c) transducer support structure projecting from said frame and mounting said transducer for oscillatory movement about an axis;

(d) drive means for driving said transducer support structure to effect oscillatory movement of said transducer about said axis; and



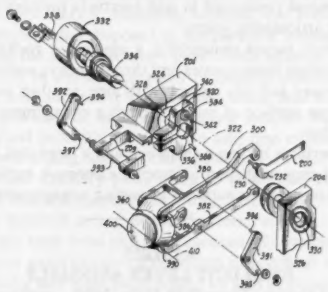
(e) oscillation varying means operatively interposed between said transducer support structure and said drive means for mechanically varying the magnitude of transducer oscillation while said drive means is driving said transducer support structure.

4,130,022

ULTRASONIC SECTOR SCANNING SEARCH UNIT

Albert S. Goodrich, and Thomas M. Corcoran, both of Newton, Conn., assignors to Picker Corporation, Cleveland, Ohio

Filed Nov. 12, 1976, Ser. No. 741,412
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—633 **3 Claims**



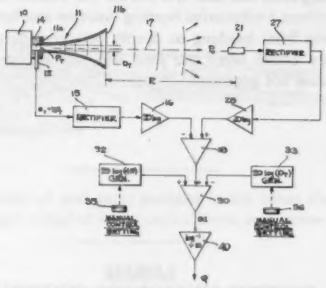
1. An ultrasonic scanning unit comprising:
(a) a supporting chassis;
(b) an ultrasonic transducer having a surface through which ultrasonic beams are conveyed;
(c) a pantographic system carried by the chassis and supporting said transducer for pivotal oscillatory movement about an axis which is fixed with respect to the transducer and with respect to the chassis and which coincides with said surface; and
(d) drive means for imparting motion to said pantographic structure;
(e) said pantographic system comprising:
(i) a first link structure drivingly connected to said drive means and supported by the chassis for rotation about a second axis fixed with respect to the chassis and parallel to the first axis, said first link structure having portions extending oppositely away from said second axis;
(ii) a second link structure supporting said ultrasonic transducer;
(iii) a driven link structure supported by said chassis at a point on said second axis displaced laterally from said first link structure for rotation about said second axis, said driven link structure having portions extending laterally away from said second axis;
(iv) at least two intermediate articulating links pivotally connected to the respective lateral portions of said first link and said driven link and projecting therefrom toward said second link structure, said articulating link pivotally connected to the second link structure to transmit oscillatory motion from the first link to the second link, said pivot connection disposed such that any four co-planar pivot points form the vertices of a parallelogram.

4,130,023

METHOD AND APPARATUS FOR TESTING AND EVALUATING LOUDSPEAKER PERFORMANCE

Clifford A. Henricksen, Yorba Linda, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Dec. 27, 1977, Ser. No. 864,738
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—647 **9 Claims**



6. A method for determining the directivity characteristics of a loudspeaker having a throat comprising the steps of:
generating a first electrical signal representing the acoustical pressure (P_T) at the throat of the loudspeaker,
generating a second electrical signal representing the on-axis acoustical pressure (P_O) of the loudspeaker at a predetermined distance (R) from the mouth thereof,
generating a third electrical signal in accordance with the ratio between said second and first signals, and
generating a fourth electrical signal which is in accordance with the third signal multiplied by a factor in accordance with said predetermined distance (R) divided by the value of the diameter (D_T) of the loudspeaker throat, said fourth signal representing the directivity index of the loudspeaker.

4,130,024

SLIDING MEANS FOR PRECISION MACHINERY

Toshimi Hayasaka, Hino, and Toshikazu Nakajima, Ina, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1977, Ser. No. 809,415
Claims priority, application Japan, Jun. 30, 1976, 51-85158[U]
Int. Cl.[2] F16H *19/04*
U.S. Cl. 74—29 **5 Claims**

1. For precision machinery which includes a body having a fixed part fixed thereto and a movable part slidable along a guide mounted to said fixed part,
a sliding means, comprising:
(a) a rack fixed to said moving part and having a row of rack teeth extending thereon lengthwise thereof;
(b) a pinion journalled for rotation on said fixed part and

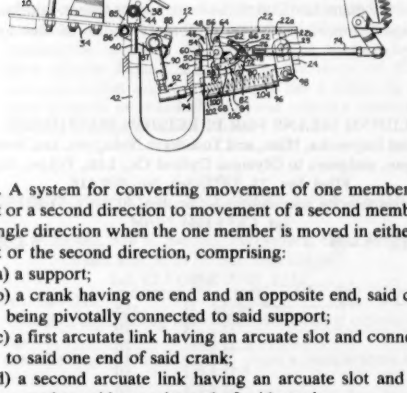
having a row of pinion teeth extending thereon circumferentially thereof;
(c) said pinion being meshed with said rack;
(d) said rack including a first contact surface means extending lengthwise thereof near said rack teeth;
(e) said pinion including a second contact surface means extending circumferentially thereof near said pinion teeth;
(f) said first contact surface means being constantly in sliding contact with said second contact surface means;
(g) the spatial disposition of the first contact surface means relative to said rack teeth and the spatial disposition of the second contact surface means relative to the pinion teeth being such that said first and second contact surface means perform a substantial bearing function and limit the pinion teeth from meshing so deeply between the rack teeth as they could were the first and second contact surface means not provided.

4,130,025

CONTROL LINKAGE FOR CONVERTING ALTERNATING ROTARY MOTION INTO UNIDIRECTIONAL MOTION

Dennis E. Dawson, Highland Heights, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 25, 1977, Ser. No. 855,037
Int. Cl.[2] F16H *25/08;* B60K *26/04*
U.S. Cl. 74—53 **22 Claims**



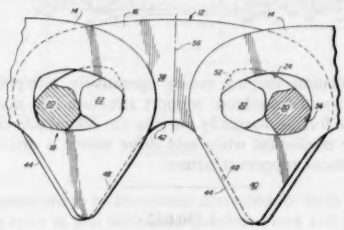
1. A system for converting movement of one member in a first or a second direction to movement of a second member in a single direction when the one member is moved in either the first or the second direction, comprising:
(a) a support;
(b) a crank having one end and an opposite end, said crank being pivotally connected to said support;
(c) a first arcutate link having an arcuate slot and connected to said one end of said crank;
(d) a second arcuate link having an arcuate slot and connected to said opposite end of said crank;
(e) a third link, said third link being movable in a single direction to move the second member;
(f) means for connecting siad first link, said second link and said third link in common, said connecting means being slidable in said arcuate slot of said first link and said second link; and
(g) means for rotating said crank in one direction in response to movement of the one member in the first direction and for rotating said crank in the opposite direction in response to movement of the one member in the second direction.

4,130,026

POWER TRANSMISSION DRIVE

Joseph O. Jeffrey, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 18, 1976, Ser. No. 742,808
Int. Cl.[2] F16G *13/06, 15/12*
U.S. Cl. 74—245 S **12 Claims**



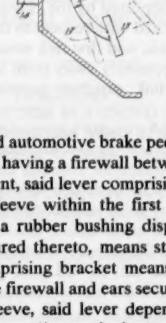
1. A power transmission chain of the type adapted to cooperatively engage driving means on a rotating member comprising:
a series of overlapping and interlaced sets of links having aligned apertures formed therethrough, and
pivot means positioned in said apertures forming said chain with articulating joints;
said pivot means comprising a pin and a rocker each of which has three convex and three concave surfaces which alternate and are joined with one another and with a convex surface of each in rocking engagement with one another;
said apertures having a small end and a large end, said small end being so shaped to receive a concave surface and its flanking convex surfaces in seating engagement.

4,130,027

RESILIENT LEVER ASSEMBLY

John D. Leighton, Bloomfield Hills, Mich., assignor to Betty Leighton, Bloomfield Hills, Mich., a part interest

Continuation-in-part of Ser. No. 693,104, Jun. 4, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,647
Int. Cl.[2] G05G *1/14*
U.S. Cl. 74—512 **6 Claims**



1. A rigid elongated automotive brake pedal lever or the like mounted on a vehicle having a firewall between the engine and passenger compartment, said lever comprising a sleeve fixed to one end, a second sleeve within the first sleeve and spaced inwardly therefrom, a rubber bushing disposed between the two sleeves and secured thereto, means stationarily securing the inner sleeve comprising bracket means having a portion secured to the vehicle firewall and ears secured to the opposite ends of said inner sleeve, said lever depending downwardly from said bracket, a stop adjacent the lever, and means holding the stop in a position such that the rubber bushing will be

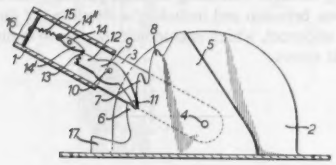
stressed in a direction constantly urging the lever against the stop.

4,130,028

PAWL-AND-RATCHET CATCH

Aasmund Solberg, Leirsund, Norway, assignor to Angel Mork, Gjerdrum, Norway

Filed Jun. 9, 1977, Ser. No. 805,102
Int. Cl.[2] G01H *3/12*
U.S. Cl. 74—577 R **2 Claims**



1. A pawl catch device comprising two relatively rotatable parts, the first part having a main pawl pivotally mounted thereon with a tongue that engages with the teeth on a toothed sector on the second part, said second part having a shaft about which the first part is rotatably secured, the teeth on the toothed sector being disposed at successively increasing distances from the shaft, the main pawl being adapted to catch automatically in any of a plurality of angular positions in engagement with successive ones of said teeth, said main pawl having a plurality of radially extending notches therein, an auxiliary pawl pivotally mounted on said first rotatable part, spring means urging said auxiliary pawl toward said notches, said teeth and auxiliary pawl being so positioned relative to each other that movement of said tongue from tooth to tooth along said toothed sector in the direction in which the distances of said teeth from said shaft successively increase causes said auxiliary pawl to move from notch to notch on said main pawl whereby said main pawl is held by said auxiliary pawl in such an angular position that upon reversal of the direction of rotation of the parts relative to each other, said main pawl will bypass the top of the teeth of lesser height that have been passed by said main pawl.

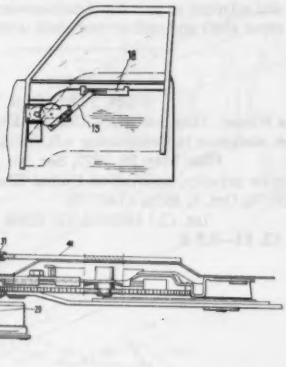
4,130,029

DRIVE ARRANGEMENT FOR MOVING A GLASS PANEL OF A WINDOW OF A VEHICLE

Bernd Klüting, Radevormwald, and Horst Kutschat, Wuppertal-Ronsdorf, both of Fed. Rep. of Germany, assignors to Keiper KG, Remscheid, Fed. Rep. of Germany

Filed Jan. 25, 1977, Ser. No. 762,421
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603489
Int. Cl.[2] F16H *35/00*
U.S. Cl. 74—625 **16 Claims**

1. An arrangement for alternately opening and closing a vehicle window, having a glass panel, the arrangement comprising displacing means connected to the glass panel for displacing the same, said displacing means including an input member which is rotatable in one direction to thereby open the window, said input member being movable between a first position and a second position; a motor coupled to said input member in the first position and uncoupled therefrom in the second position, whereby said motor rotates said input member by a motor-driven operation when said input member is in the first position to thereby displace the glass panel; a handle coupled to said input member when said input member is in the second position so as to thereby manually rotate said input member in order to displace the glass panel; and deactivable locking means connected to said input member in such a manner that said locking means are operative only until deactivated and while said input member is in the second position so as to



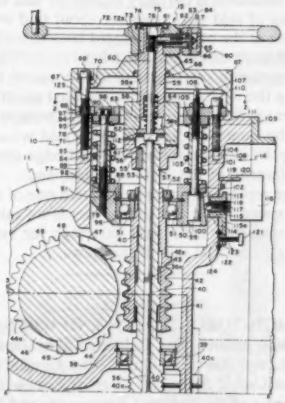
prevent rotation of said input member in the other direction when said input member is uncoupled from said motor.

4,130,030

MANUALLY SHIFTED ACTUATOR

Andrew Stratienko, Philadelphia, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 4, 1977, Ser. No. 784,391
Int. Cl.[2] F16H *33/00*
U.S. Cl. 74—625 **10 Claims**



1. A valve actuator assembly comprising:
an actuator housing assembly;
a stem engagement gear assembly having a circular gear ring, and a helical gear sleeve in engagement therewith;
a drive motor having an output shaft with power transfer means slidably located thereon and resiliently biased outward therefrom;
a rotatable hollow power shaft coaxially aligned with said output shaft, having power transfer means at each end thereof, and slidably engaged inside said gear sleeve with means to prevent rotation of said gear sleeve with respect to said power shaft;
a manual rotation assembly having a rotatable input shaft slidably and rotatably held in said housing assembly in coaxial alignment with said power shaft, a manual operator on said input shaft, and power transfer means secured on said shaft and arranged to be moved into engagement with said power transfer means on said power shaft; and,

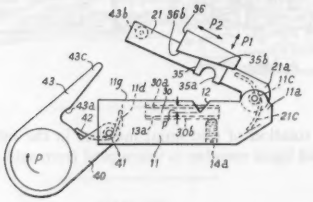
sliding means in said power shaft extending outward from each end thereof, arranged to abut said output shaft power transfer means and said input shaft power transfer means, and adapted to prevent simultaneous engagement of said input shaft and said output shaft with said power shaft.

4,130,031

WIRE STRIPPER

Hans Wiener, Täby, and Hans Undin, Åkersberga, both of Sweden, assignors to Pressmaster AB, Stockholm, Sweden

Filed May 26, 1977, Ser. No. 801,016
Claims priority, application United Kingdom, Jun. 9, 1976, 23819/76; Oct. 6, 1976, 41487/76
Int. Cl.[2] H02G *1/12*; B26B *29/00*
U.S. Cl. 81—9.5 R **44 Claims**



1. A wire stripper comprising;

a pair of elongated rigid jaws hinged together at one end by an axle pin, one of said jaws being formed with at least one blade having a cutting edge turned toward the other jaw, said other of said jaws being formed with a bed open in the direction of said one of said jaws and formed with a notch open toward said blade and adapted to receive a wire whose insulation is partially incised by said edge upon the clamping of said jaws together about said wire;

latch means at the other end of said jaws to lock said jaws in a closed position about said wire;

a finger-receiving eye connected to one of said jaws for enabling the wire stripper to be twirled about by the finger of a user to effect relative rotation of the wire and the jaws when the same are clamped upon said wire, thereby extending the incision formed by said edge about the entire circumference of the said insulation; and

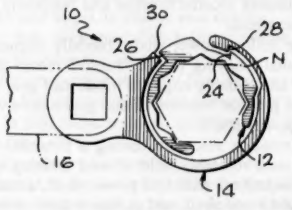
a cartridge replaceably received in said one of said jaws and carrying said blade and detent means on said one of said jaws engageable with said cartridge for retaining same immovably on said one of said jaws.

4,130,032

HIGH-TORQUE OPEN-END WRENCH

Anthony Giandomenico, San Gabriel, Calif.; James M. Dame, Slidell, La., and Harold Behimer, West Covina, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 29, 1977, Ser. No. 828,262
Int. Cl.[2] B25B *13/02, 13/58*
U.S. Cl. 81—119 **7 Claims**



1. A wrench usable where limited access normally requires an open-end wrench, but which has substantially the high torque capacity of a closed-end, or socket wrench, comprising:

a sleeve forming a socket with a gap in its side, said sleeve having a plurality of wrench faces on its inside to engage and apply large torque to a nut; and

an adaptor forming a socket with a gap in its side, said adaptor formed to surround the region of said sleeve which forms said gap and to lie close to portions of said sleeve which lie on opposite sides of said sleeve gap to resist spreading apart of said sleeve portions;

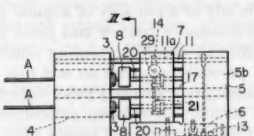
said sleeve and adaptor having engageable torque-transmitting surfaces extending at least partially in radial directions, between and including a direct radial direction and an undercut, which enable said adaptor to apply torque to said sleeve.

4,130,033

MULTIPLE SPINDLE AUTOMATIC SCREW MACHINE

Yoshifumi Tsuchiya, 6 of 1373, Baigo 6, Ohme-shi, Tokyo, Japan

Filed Jun. 7, 1977, Ser. No. 804,282
Claims priority, application Japan, Aug. 13, 1976, 51-96788
Int. Cl.[2] B23B *9/04, 11/00*
U.S. Cl. 82—3 **4 Claims**



1. A multiple spindle automatic screw machine comprising:

a plurality of work spindles each work spindle for holding a workpiece extending frontwardly thereof, said work spindles peripherally and equally spaced around an indexing drum;

a plurality of tool brackets, the number of said tool brackets equalling the number of said work spindles, said tool brackets opposedly mounted frontwardly of said work spindles, said tool brackets each including a guide bush in fixed relationship thereto to support said workpiece;

working tools mounted on each of said tool brackets;

means for producing relative motion between said workpieces and said working tools;

means for rotationally indexing said indexing drum with said work spindles, whereby each of said work spindles in turn opposes each of said tool brackets;

means for reciprocally translating said tool brackets with said guide bushes toward and away from said indexing drum and said work spindles, whereby said workpieces are translated away from said guide bushes for indexing said drum, and said workpieces are supported by said guide bushes when said tool brackets are translated toward said work spindles for machining of said workpieces;

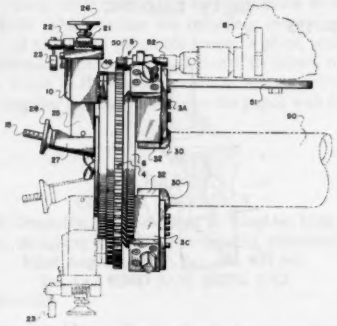
a bed, said bed supporting said indexing drum and said tool brackets;

whereby the relationship between each of said guide bushes and each of said tool brackets is unchanged when said work spindles index said workpieces.

4,130,034
PORTABLE REFACING MACHINE

Lloyd F. Benoit, Rt. 1, Box 57B, Arnaudville, La. 70512

Filed Jun. 20, 1977, Ser. No. 808,053
Int. Cl.[2] B23B *3/34*
U.S. Cl. 82—4 C 3 Claims



1. A portable apparatus for refacing pipe section joints, and the like, without the need of threaded adaptors, comprising:

a support housing;

a set of four movable members, telescopically mounted on said support housing at substantially equal distances from each other, and adapted to detachably secure a pipe section from the outer surface of the pipe section;

a first ring gear, rotably mounted on said support housing;

a cutting head, provided with one cutting element, and connected to said first ring gear by means comprising a casing, mounted on said first ring gear, a shaft, connected to said cutting head and telescopically mounted within said casing, a second ring gear, connected to said shaft so as to cause said shaft to move perpendicularly to the longitudinal axis of said second ring gear as said second ring gear rotates, a worm gear, engaged to said second ring gear, and a weight, rotably connected to the shaft of said worm gear;

two symmetrical slotted plates, detachably mounted on one flat surface of said support housing, and provided with inwardly extending protrusions for positioning the joint shoulders of the pipe section within about 1/16 of an inch from the face of said cutting head, and

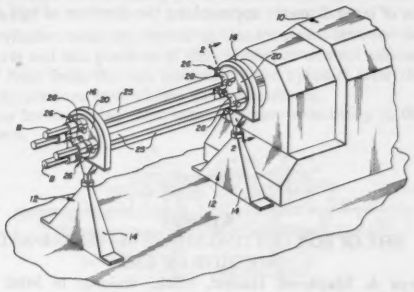
means for imparting rotational motion to said first ring gear comprising a drive gear, engaged to said first ring gear, a drive shaft, connected to said drive gear, and a reversible electric motor.

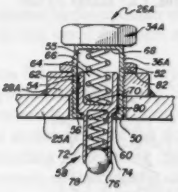
4,130,035
SPRING MOUNTED SUPPORT FOR BARSTOCK

Allie B. Langley, 11810 Chimney Rock, #54, Houston, Tex. 77035

Filed Oct. 26, 1977, Ser. No. 845,519
Int. Cl.[2] B23B *13/08, 25/00*
U.S. Cl. 82—38 A 3 Claims

1. In combination with a machine having tools operating upon a plurality of bars being fed longitudinally within the machine for forming workpieces; a plurality of tubes extending generally horizontally from the machine each receiving a bar therein, bar supporting means spaced along the length of each tube to support the bar therein in spaced relation to inner surface of the associated tube, said bar supporting means including at least three bar supports carried by the associated tube and spaced about the circumference of the bar, each bar support comprising an outer housing fixed to the associated tube, an elongated spring carrier fitting within the housing and extending through an opening in the associated tube, said spring carrier having an inner bore extending within the tube, a spring mounted in said inner bore, a ball carried by the inner end of the spring carrier projecting beyond the spring carrier to contact an adjacent bar and resiliently urged by the spring



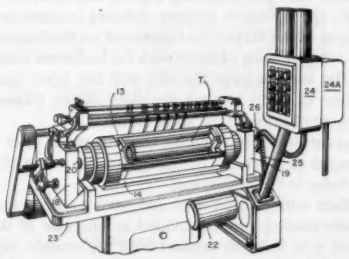


into contact with the bar, and means resiliently mounting the spring carrier for movement relative to the outer housing toward and away from the bar.

4,130,036
APPARATUS FOR CUTTING TUBES

Anthony V. Thomas, Prospect Heights, Ill., assignor to Precision Paper Tube Compay, Wheeling, Ill.

Filed Oct. 6, 1977, Ser. No. 839,806
Int. Cl.[2] B23B *5/14*
U.S. Cl. 82—90 2 Claims



1. Apparatus for cutting a long paper tube into individual sections comprising: cradle means for holding the tube; means for mounting said cradle for rotation about a horizontal axis; means for driving said cradle in rotation from a load position through a cutting position and back to a load position; a plurality of saws mounted on a shaft having an axis parallel to the axis of rotation of said cradle; means for driving said saws at high speed; surface-drive means for engaging the surface of said tube at the cutting position for spinning the tube in said cradle during cutting, said cradle including a pair of end discs; means for securing said discs together to form a balanced rotatable member; a pair of stub shafts secured to said discs respectively for supporting the same while permitting the

rotation thereof; first and second base plates extending between and mounted to said side discs and spaced at right angles toward the periphery of said disc to permit the support of a tube of large diameter approaching the diameter of said discs.

4,130,037

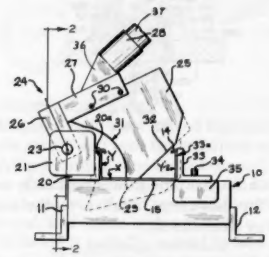
SHEAR FOR CUTTING SHEET MATERIAL AND METHOD OF USE

Loren A. Matthews, Haslett, Mich., assignor to Matt Tool Corporation, Haslett, Mich.

Filed Jun. 17, 1977, Ser. No. 807,449

Int. Cl.[2] B23D *23/00*

U.S. Cl. 83—56 **9 Claims**



1. A shear for cutting building channel which is U shaped with a backbone and two parallel sides to a predetermined length which comprises:

(a) a frame having an elongate slot in a flat surface on the frame with a straight edged surface;

(b) a pair of spaced apart parallel plates mounted adjacent to and perpendicular to the flat surface on the frame having holes in each plate defining a pivot axis towards the slot;

(c) two spaced apart holders defining extensions of the straight edged surface and mounted on the frame so as to position a building channel with the backbone mounted on the flat surface over the slot and the sides against the holders so as to prevent the sides of the channel from being bent outward out of parallel;

(d) a pivot arm moveable by hand to pivot over the slot mounted between the parallel plates by means of a pin in the holes in the plates; and

(e) a blade with parallel sides and having a point formed by double cutting edges provided at one side of the blade which is in slideable contact with the straight edged surface of the slot which edges are at an angle of between about 30° to 70° to each other one of which nearest the pivot axis is concave, which blade is mounted and positioned on the pivot arm to be moveable into the slot adjacent the straight edged surface such that the backbone of the channel is pierced at about the center and cut towards the sides of the channel on both cutting edges as the blade is forced into the slot adjacent the straight edged surface on the frame and such that an edge of the blade opposite the concave edge first cuts into one side of the channel against one holder and then the concave edge of the blade cuts into the other side of the channel against the other holder and along the extensions of the straight edged surfaces on the holders until the channel is cut to length without significantly distorting the sides or backbone.

4,130,038

THREAD PARTING DEVICE FOR TEXTILE MACHINES

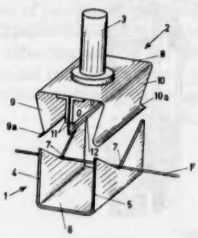
Ulrich Zehnder, Einsiedeln, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Jun. 20, 1977, Ser. No. 808,093

Claims priority, application Switzerland, Jul. 22, 1976, 9432/76

Int. Cl.[2] B26D *7/02*

U.S. Cl. 83—175 **7 Claims**



1. A thread parting device for textile machines, comprising:

a fixed, separating member, comprising two mutually parallel thread guide plates spaced from each other;

a cutting edge-containing cutting body movable toward said fixed separating member and operable by means of said textile machine, comprising a U-shaped thread tensioning bow having two spring clamping shanks which during the course of a cutting motion of said device are slideable against the outer surfaces of said thread guide plates with a predetermined contact pressure in order to tension a thread guided crosswise over the thread guide plates, and

a blade so arranged on said cutting member between and parallel to said clamping shanks that in the direction of the cutting motion its cutting edge lies behind said clamping edges of said spring clamping shank.

4,130,039

CUTTING DEVICE

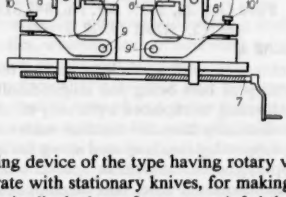
Günter Heyden, and Günter Geitz, both of Neuwied, Fed. Rep. of Germany, assignors to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co., KG, Neuwied am Rhein, Fed. Rep. of Germany

Filed Jun. 20, 1977, Ser. No. 807,844

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628728

Int. Cl.[2] B26D *5/20*

U.S. Cl. 83—356.3 **3 Claims**



1. In a cutting device of the type having rotary vane knives which cooperate with stationary knives, for making patterned cuts in the longitudinal edges of a paper web fed therepast, for the preparation of envelopes or envelope blanks, the improvement comprising:

at least one cooperating knife pair, including

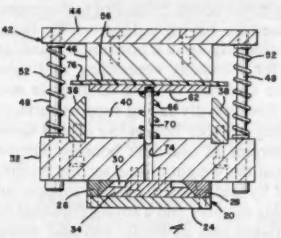
one rotary knife made of an aluminium alloy and one stationary knife made of hardened steel, disposed for cooperative engagement, for making patterned cuts in the edges of

paper webs moving therepast, said blades being made of materials differing from one another in hardness to an extent such that the softer knife can have material removed from it without damage to the latter, and at least one of the knives of said cooperating knife pair being mounted for feeding movement toward its associated cooperating knife, while the cutting device is operated, said knife which makes the infeeding movement, being mounted on a frame pivotable around a pivot, which pivot is positioned such that, irrespective of its infeed, the rotary knife, when in the cutting position, always takes up the same angular position relative to the paper web fed therepast.

4,130,040
CUTTER ASSEMBLY

Charles W. Donnelly, Sr., and Larry R. Stauffer, both of Camp Hill, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 23, 1977, Ser. No. 827,041
Int. Cl.² B26D *5/10*; H02G *1/12*
U.S. Cl. 83—389 **8 Claims**



8. In combination with a press having a frame, a ram, and ram actuation means, a cutter assembly for profiling a free end of multi-conductor flat flexible cables and the like, said cutter assembly comprising:

a base member mounted on said press frame so as to be moveable between a first position beneath said ram and a second position remote from and clearing said ram,

shear means secured to and extending from said base member defining a profile including a pair of fixed, parallel, spaced side blades, and a fixed transverse end blade normal to said side blades adjacent one end thereof,

a shear head mounted on said base member for reciprocal movement therebetween, said shear head being receivable within said profile to cause a shearing action with said shear means;

cable stop means fixed to said shear head beyond said transverse end blade; and

means to hold said cable against said shear head and moveable therewith whereby cable carried thereby is sheared to said profile upon actuation of said press.

4,130,041
VENEER CLIPPER

David L. McGee, Portland, Oreg., assignor to Plymak Company, Inc., Portland, Oreg.

Division of Ser. No. 522,576, Nov. 11, 1974, Pat. No. 4,041,820. This application May 9, 1977, Ser. No. 795,220
Int. Cl.² B26D *5/12*; B27L *5/08*
U.S. Cl. 83—617 **1 Claim**

1. In an improved veneer slipper,

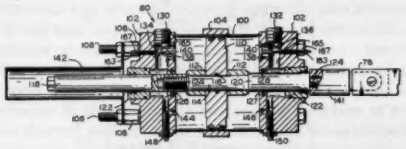
reciprocable knife means,

double acting cylinder means including a cylinder having heads provided with bores and counterbores and a piston member slidable in the cylinder and having a rod at each end slidable in the bores, the piston member also having shorter plug portions on the rods adapted to enter the counterbores near the ends of the strokes of the piston member,

the cylinder heads having ports connected to the counterbores,

the cylinder means also including bleeder means between the ports and end portions of the cylinder to control exhaust of fluid from the end portions of the cylinder after the plug portions have closed the counterbores,

means for supplying fluid under pressure selectively to the ports,



actuating means driven by the cylinder means for reciprocating the knife means once for each stroke of the piston member,

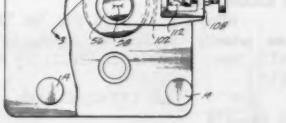
check valve means for connecting the ports to the end portions of the cylinder to bypass the bleeder means when fluid under pressure is supplied to the ports,

each check valve means being of the poppet type including a valve rod extending through the cylinder head, a spring on the rod exteriorly of the cylinder, and adjustable spring seat means on the rod exteriorly of the head.

4,130,042
ADJUSTABLE ANVIL ROLL FOR DIE-CUTTING LABELS

Charles F. Reed, Painesville, Ohio, assignor to Avery International Corporation, San Marino, Calif.

Filed Jul. 25, 1977, Ser. No. 818,546
Int. Cl.² B26F *1/42*; B26D *3/08*
U.S. Cl. 83—887 **10 Claims**

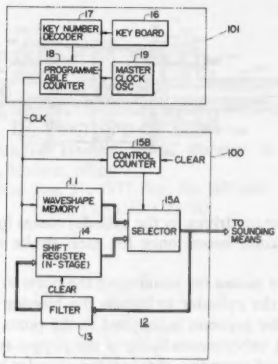


1. A roll cutter assembly comprising a pair of rolls having cylindrical bearing portions at the ends of the rolls, the cylindrical bearing portion of one of said pair of rolls being in rolling contact with the cylindrical bearing portion of the other roll to maintain fixed spacing between the rolls, the cylindrical bearing portions of the first roll each including an outer annular bearing having an outer circular surface in rolling contact with one of the bearing portions of the second roll, an inner bearing, the first roll being journaled in the inner bearings, an annular eccentric cam having inner and outer cylindrical eccentric surfaces positioned between the inner and outer bearings, whereby the inner bearing is mounted eccentrically within the outer bearing, and means for adjusting the angular positions of the cams to vary the distance between the rolls.

4,130,043
ELECTRONIC MUSICAL INSTRUMENT HAVING FILTER-AND-DELAY LOOP FOR TONE PRODUCTION

Koji Niimi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 13, 1976, Ser. No. 732,181
Claims priority, application Japan, Dec. 16, 1975, 50/149148
Int. Cl.[2] G10F *1/00*
U.S. Cl. 84—1.03 **9 Claims**

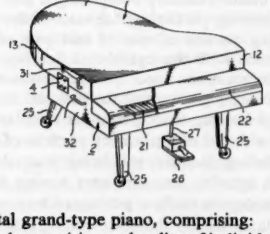


1. An electronic musical instrument comprising:
waveshape generating means for generating during a time period of predetermined length a waveshape defining a period of a tone wave to be sounded, said time period being determined according to a frequency of a musical tone to be produced by said musical instrument; and
a loop circuit connected to said waveshape generating means for receiving said waveshape of said length, and including a filter and a delay means connected in a loop for repetitively circulating therein said waveshape, and having a delay time equal to the length of said predetermined time period, providing thereby for a period of said signal to circulate in the loop circuit once, said loop circuit delivering out a musical tone signal having said frequency.

4,130,044
KEYBOARD MUSICAL INSTRUMENT AND IMPROVED PIANO

Takashi Yamada; Yasutoshi Kaneko, and Kazuo Murakami, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 13, 1976, Ser. No. 722,398
Claims priority, application Japan, Sep. 16, 1975, 50-125929[U]; Nov. 19, 1975, 50-156221[U]; Nov. 19, 1975, 50-156223[U]
Int. Cl.[2] G10C *3/02*
U.S. Cl. 84—176 **21 Claims**

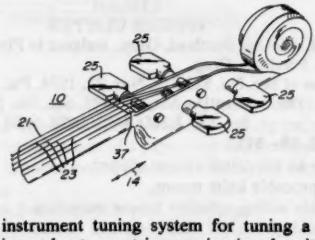


1. A horizontal grand-type piano, comprising:
(A) a keyboard comprising a plurality of individually actuatable keys;
(B) an action assembly comprising:
(1) a plurality of hammers, a different said hammer associated with each of said keys;
(2) linkage means for impelling each said hammer from a first, rest position towards a second, operative position in response the actuation of its corresponding said key;
(C) a first, elongated housing member at least partially housing said keyboard and said action assembly, said first housing member having an opening in the upper surface thereof, each of said hammers being so oriented within said first housing member that each said hammer lies below said opening and within said first housing member when it is in its first, rest position and lies above said opening and without said first housing member when it is in said second, operative position, said first housing member having an upwardly facing, elongated support surface lying in a horizontal plane;
(D) vertical leg means for supporting said first housing member above a horizontal support plane such that said first housing member is elongated in a generally horizontal plane;
(E) a plurality of piano strings carried by a piano plate;
(F) a second, elongated housing member at least partially housing said piano plate and said strings, an opening formed in the bottom of said second housing member and providing direct access to each of said strings, said second housing member having a downwardly facing elongated support surface lying in a horizontal plane; and
(G) means for releasably connecting said second housing member to said first housing member in such a manner that said downwardly facing support surface of said second housing member lies on top of said upwardly facing support surface of said first housing member in such a manner that the weight of said second housing member is supported by said upwardly facing support surface of said first housing member and a strong frictional force is established between said upwardly and said downwardly facing support surfaces;
(H) said strings being so located within said second housing member that they lie in a generally horizontal plane when said second housing member is coupled to said first housing member;
(I) said second housing member lying in a generally horizontal plane on top of and offset with respect to said first housing member;
(J) said opening in said first housing member communicating with said opening in said second housing member; and
(K) the relative location of said hammers and said strings being such that each of said hammers strikes a different set of said strings when its respective key is actuated.

4,130,045
STRING INSTRUMENT TUNING SYSTEM

William C. Walker, 7665 Marcin Dr., Glen Burnie, Md. 21061

Continuation-in-part of Ser. No. 647,979, Jan. 9, 1976, Pat. No. 4,062,265. This application Oct. 25, 1977, Ser. No. 845,442
Int. Cl.[2] G10D *3/14*
U.S. Cl. 84—297 R **11 Claims**



1. A string instrument tuning system for tuning a string instrument having at least one string passing in a longitudinal direction, comprising:
(a) first means for indication formed on a surface of said

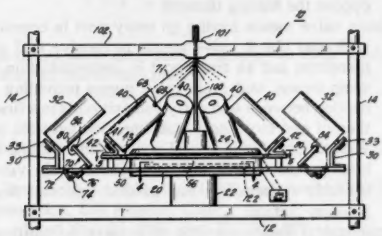
string of said string instrument, said first indication means having at least one indicia zone, and,

(b) second means for indication disposed upon said string instrument, said second indication means having cooperative indicia for alignment with said first indication means in said indicia zone for determining a tension load on said string of said instrument.

4,130,046
BRAIDING MACHINE WITH CONTINUOUS TENSION FILAMENT CONTROL

Vincent Sokol, 93 Sunnyside Dr., Yonkers, N.Y. 10705

Filed Feb. 15, 1978, Ser. No. 877,980
Int. Cl.[2] D04C 3/42, 3/06
U.S. Cl. 87—48 **64 Claims**



1. A machine for braiding filaments, comprising:

a mandrel at a central axis on which said mandrel the filaments are braided;

an array of first bobbins, or the like, each for supplying a respective filament to be braided; first moving means for supporting and for moving said first bobbins annularly around said central axis in a first direction; each said first bobbin having a top side and an underside;

an array of second bobbins, or the like, each for supplying a respective filament to be braided;

a respective filament guide means for each said second bobbin; the filament from each said second bobbin being guided by its said filament guide means; second moving means for supporting and for moving said guide means annularly around said central axis in a second direction opposite said first direction; each said guide means having an entrance thereto at which filament from the respective said second bobbin enters said guide means; each said guide means having an exit therefrom out of which filament leaves the respective said guide means; said guide means exits all being further from said mandrel than said first bobbins;

said second moving means comprises a support for each said guide means which is connected with the respective said second bobbin that supplies filament to that said guide means such that the location of each said guide means entrance remains fixed with respect to the location of the respective said second bobbin, while each said guide means exit moves with respect to said second bobbin as said guide means is moved;

said guide means each being movable in a manner that raises and lowers said guide means filament exits, raising the filament exiting from each said guide means exit to a level at which the filament passes over a said first bobbin top side and lowering the filament exiting from each said guide means exit to a level at which the filament passes under said first bobbin underside; said guide means exits each being movable along a pathway wherein the tension on the filament exiting from each said exit remains substantially constant throughout the movements of said guide means to raise and lower the filament exiting therefrom;

each said guide means being oriented and adapted to move the respective said guide means exit along the respective said pathway, and said pathway is chosen so that the length of a filament section, from said guide exit to said mandrel, remains substantially constant throughout the movement of said guide means exit;

guide means moving means for so moving said guide means;

each said guide means is disengageable from the respective second bobbin array filament connectable therewith;

with first bobbins and said second bobbins also being rotatable in the respective directions opposite to their respective said first and said second rotation directions;

filament positioning means placed so as to direct filament from each said second bobbin to normally pass by one of said top side and said underside of all said first bobbins;

a deflector on said machine; said deflector having a first side edge positioned to be engaged by the filaments of said second bobbins as said second bobbins move past said deflector in the respective said second direction of rotation thereof; said deflector first side edge being shaped to deflect the second bobbin filaments to pass by the other of said top side and said underside of said first bobbin then passing said deflector;

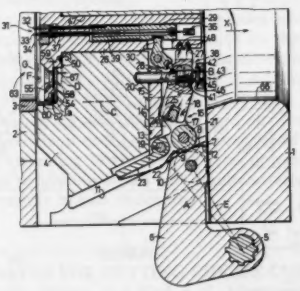
said deflector having a second side edge on the opposite side thereof from said first side edge and positioned to be engaged by the filaments of said second bobbins as said second bobbins move past said deflector in said opposite direction from said second direction; said deflector second side edge being shaped to deflect the second bobbin filaments to pass by the other of said top side and said underside of said first bobbins then passing said deflector;

a frame for supporting said bobbins and with respect to which both of said first and said second bobbins arrays rotate; said deflector being mounted to said frame and being shiftable circumferentially of said bobbin arrays with respect to said frame for positioning either of said first and said second side edges to be engaged by the filaments of said second bobbin array when said second bobbin array rotates, respectively, in said second direction and the direction opposite to said second direction.

4,130,047
SEALING SYSTEM FOR A WEDGE-TYPE BREECH MECHANISM

Anton Politzer, Robert-Koch-Str. 18, 8520 Lauf/Pegn., Germany, and Wilhelm Machmer, Salzburger Str. 34, 8500 Nürnberg, Germany

Filed Dec. 6, 1976, Ser. No. 752,827
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554728
Int. Cl.[2] F41F 11/02
U.S. Cl. 89—26 **7 Claims**



1. Apparatus for sealing the breech member of a breech mechanism of a firearm for firing caseless ammunition, the firearm having a barrel, said apparatus comprising a clamping member movably mounted in a recess provided in the breech member, drive means coupled to the clamping member for moving the clamping member between released and operative

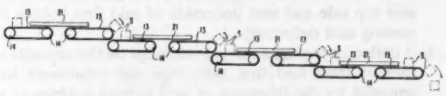
positions, a sealing ring adjacent the barrel and means coupled to said clamping member for pressing said sealing ring against the barrel, the latter means including a radially movable shifting member which undergoes radial movement as said clamping member moves between the released and operative positions, said sealing ring having one end facing the barrel and an opposite end, said shifting member including means for applying axial force to said opposite end of the sealing ring to axially clamp the sealing ring against the barrel.

4,130,048

CARPET SAMPLE BEVELING APPARATUS AND METHOD

Michael A. Lewallyn, 114 Tibbs Rd., Dalton, Ga. 30720

Filed Aug. 29, 1977, Ser. No. 828,665
Int. Cl.[2] B23C *3/12;* B24B *9/02*
U.S. Cl. 90—18 **10 Claims**



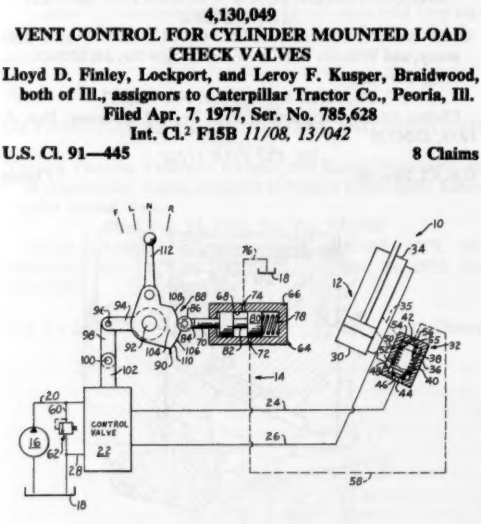
1. A method of beveling rectangular carpet samples along all of their four marginal edges comprising conveying rectangular carpet samples in succession along a horizontal path having vertical steps in said path at descending elevations while the carpet samples are supported on their edges at an inclination to the vertical for the sake of stability of the samples, engaging each sample in succession at each stepped elevation along the horizontal path and exerting a yielding holding force on the sample and beveling the lower edge of each sample during application of said holding force, and causing each carpet sample in succession to free-fall by gravity from each stepped elevation along said horizontal path to the next lowermost stepped elevation and during such free-falling to rotate ninety degrees edgewise thereby positioning another lower edge of each sample for beveling at each successive stepped elevation until the four edges of each sample are beveled.

4,130,049

VENT CONTROL FOR CYLINDER MOUNTED LOAD CHECK VALVES

Lloyd D. Finley, Lockport, and Leroy F. Kusper, Braidwood, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 7, 1977, Ser. No. 785,628
Int. Cl.[2] F15B *11/08, 13/042*
U.S. Cl. 91—445 **8 Claims**



1. In a hydraulic motor and control system therefor which comprises fluid source means for delivering fluid from sump means via first conduit means to control valve means having a float position wherein a first end of said motor is in flow communication with sump means, a first position for applying fluid from said fluid source means to power said motor to move in a first direction by delivering said fluid to said first end thereof via second conduit means and a second position in which said control valve means applies fluid from said fluid supply source means to power said motor in a second direction by delivering said fluid to a second end thereof via third conduit means; and sump conduit means communicating said control valve means with sump means; an improvement comprising:

check valve means in said second conduit means allowing fluid flow therethrough to said first end of said motor and normally biased to block reverse fluid flow therethrough from said first end of said motor to said control valve means, said check valve means being operable to allow said reverse fluid flow therethrough responsive to communication to said sump means via check valve means and drain conduit means of a pilot flow from said first end of said motor which is applied to said check valve means to oppose the biasing thereof;

drain valve means having an entry port in communication with said check valve means to receive said pilot flow therefrom and an entry port in communication with said sump means, said drain valve means providing interconnection between said entry and exit ports in a first position thereof and blocking interconnection between said entry and exit ports in a second position thereof and including biasing means normally biasing said drain valve means towards a respective one of said first and said second position thereof;

mechanical means moving responsive to shifting of said control valve means to shift said drain valve means into said first position thereof when said control valve means is in said second and float positions and into said second position thereof when said control valve means is in the first position, said mechanical means comprising bellcrank means linked via first linking means at a first arm thereof to said control valve means, directly linked via second linking means at a second arm thereof to said drain valve means and pivoted to frame means intermediate said first and second arms thereof, said mechanical means exerting a force directly upon said drain valve means in opposition to said biasing means sufficient to position said drain valve means in said first position in said second and float control valve position and in said second position in said first control valve position, said second linking means comprising a cam surface on said second arm of said bellcrank means, and, cam follower means on a first end of a drain spool of said drain valve means, said cam surface moving on rotation of said bellcrank means to position said drain spool in said first position responsive to shifting of said control valve means into said lower and float positions and to position said drain spool into said second position responsive to shifting of said control valve means into said first position.

4,130,050

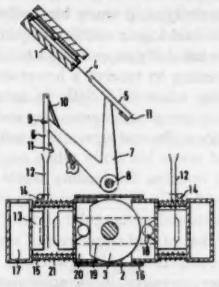
PROCESS AND APPARATUS FOR THE PRODUCTION OF CARDBOARD PLATES AND THE LIKE

Godi Graf, Effretikon, Switzerland, assignor to Maschinenfabrik Gietz AG., Switzerland

Filed Jun. 13, 1977, Ser. No. 806,059
Claims priority, application Switzerland, Aug. 31, 1976, 11104/76
Int. Cl.[2] B31D *5/02;* B31F *1/00*
U.S. Cl. 93—1 D **7 Claims**

1. A machine for punching sheet material to produce separate punched pieces and distributing the punched pieces to presses in a multiple press, the machine comprising a punching apparatus for producing, in series, substantially flat pieces to be pressed, a multiple press comprising a plurality of presses each including a pair of dies for pressing one said piece when that piece is delivered between said dies, guiding elements allocated respectively to individual ones of said presses for guiding said pieces to said dies, and a distributing means for receiving, in

series, all said pieces produced by said punching apparatus and for delivering them one by one in a cyclic sequence to said



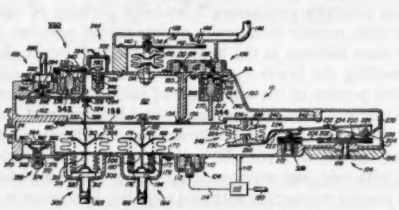
guiding elements such that during each cycle each guiding element receives one of said pieces.

4,130,051

PNEUMATIC AUTOSCHEDULE CABIN PRESSURE CONTROLLER

Myron J. Brudnicki, Los Alamitos, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 22, 1976, Ser. No. 753,409
Int. Cl.[2] B64D *13/00*
U.S. Cl. 98—1.5 **47 Claims**



1. Fluid pressure control apparatus, comprising:
(a) wall means enclosing a chamber for containing a fluid at a pressure to be controlled;
(b) first and second port means defining respective first and second passageways communicating through said wall means between the interior and exterior of said chamber;
(c) first and second fluid pressure sources coupled to said first and second port means, respectively,
said first source being adapted to provide a supply of pressurized fluid at a substantially constant pressure into said first passageway,
said second source being of pressure lower than said first source;
(d) first and second fluid flow control means disposed in said first and second passageways, respectively,
one of said first and second fluid flow control means comprising metering valve means; and
(e) movable wall means coupled with said metering valve means for actuation thereof to modulate the flow therethrough,
said movable wall means being subject to the pressure in said chamber.

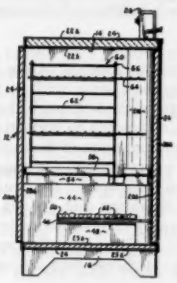
46. The method of regulation of the fluid pressure in a compartment admitting pressurized fluid through an inlet port and exhausting fluid through an outlet port provided with an outflow valve member formed as a part of an outflow valve means having a chamber defined in part by movable wall means coupled to said valve member for controlling the flow through said outlet port in accordance with fluid pressure control signals made manifest in said valve means chamber, comprising:
(a) providing fluid pressure control apparatus having wall means defining a chamber coupled by fluid pressure signal transmission means to said valve means chamber,
said apparatus chamber wall means being provided with chamber inlet and outlet port means defining inlet and outlet passageways, respectively, communicating through said chamber wall means between the interior and exterior of said apparatus chamber;
(b) coupling supply and sink sources of control fluid pressure with said inlet and outlet port means, respectively,
said supply source providing a supply of pressurized fluid at a substantially constant pressure into said inlet passageway; and
(c) disposing fluid flow control means to control the flow of controlled pressure fluid through said outlet passageway to said sink source.

4,130,052

COMBINATION SMOKER-COOKER FOR FOOD

John E. Jacobson, 11 Northwestern Dr., Topeka, Kans. 66619

Filed Mar. 30, 1976, Ser. No. 671,843
Int. Cl.[2] A23L *1/00*; A23B *4/04*
U.S. Cl. 99—339 **4 Claims**



1. A device for cooking and imparting flavor to foods comprising:
an enclosure characterized by substantially air tight construction and an absence of any source of outside air,
said enclosure presenting a substantially box-like compartment having an opening at one side thereof, said compartment being characterized by a sidewall opposite said one side which sidewall does not present any 90° angles with any other sidewalls,
said enclosure being adapted to receive means for producing flavor imparting gases or vapors upon being heated;
door means pivotally coupled with said enclosure for closing said compartment opening,
locking means for said door means comprising an elongated bar extending substantially the length of the door, means for pivotally mounting said bar on said enclosure and handle means for moving said bar from a locking to an unlocking position; and
means for raising the temperature in said enclosure to an elevated level high enough to effect cooking of the food while also effecting production of gases or vapors from said flavor producing means and simultaneously increasing the pressure in said enclosure.

4,130,053

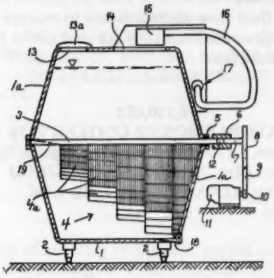
APPARATUS FOR CUTTING CHEESE CURD

Claes B. Sjöholm, Mälmo, and Karl J. G. Martensson, Lund, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Apr. 14, 1976, Ser. No. 676,876
Claims priority, application Sweden, Apr. 18, 1975, 75045047
Int. Cl.[2] A23C *19/02, 21/00*
U.S. Cl. 99—466 **4 Claims**

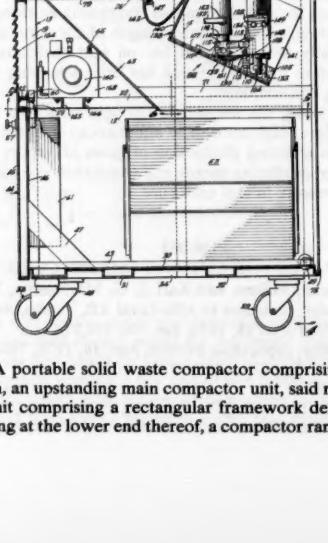
1. Apparatus for cutting and stirring cheese curd, which comprises an immobile curdling container with a circular cross

section and having a substantially horizontal axis, a cutting and stirring tool mounted within the container for rotation about said axis, driving means connected to said tool for rotating the same through a plurality of revolutions in one direction about said axis to effect a cutting operation, said tool including swingable members operable during a said cutting operation as check valves for passage of cheese curd through the tool, said swingable members being operable, in response to rotation of the tool in said one direction relative to the cheese curd, to take positions where said members permit passage of cheese curd through the tool, whereby the curd is cut, said members being



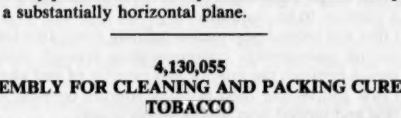
operable, in response to rotation of the tool in the opposite direction relative to the cheese curd, to take positions where they oppose passage of curd through the tool, and a control system operatively connected to said driving means for causing interruptions in the rotation of the tool in said one direction during the cutting operation and for maintaining the tool stationary at each such interruption, the control system including control means for operating said driving means to rotate the tool through a plurality of revolutions in said opposite direction about said axis, without interruptions, to effect a stirring operation in which cut cheese curd is rotated around said axis.

4,130,054
TOP LOADING WASTE COMPACTOR
Philip Tashman, 7500 NW. 41 St., Miami, Fla. 33166
Filed May 5, 1977, Ser. No. 794,251
Int. Cl.[2] B30B *15/22*
U.S. Cl. 100—52 **8 Claims**



1. A portable solid waste compactor comprising, in combination, an upstanding main compactor unit, said main compactor unit comprising a rectangular framework defining a front opening at the lower end thereof, a compactor ram, mechanism supporting said compactor ram from the upper end of said framework, hydraulic drive means for reciprocatively moving said ram vertically downwardly within said main compactor unit, a waste bin dolly, said waste bin dolly being removably receivable within said lower end front opening of said framework, said waste bin dolly supporting a box-like enclosure bin having a top opening to receive a lower end portion of said reciprocative ram when said dolly is received within said lower end front opening, said upstanding main compactor unit comprising a forwardly and upwardly-inclined, open-topped chute above said waste bin dolly when contained within said lower end front opening for feeding waste to be compacted angularly into said dolly bin, the opening of said chute being defined by a horizontal rectangular support structure located at a level below that of said upper end of said framework, said compactor ram comprising, at its lower end, a substantially flat ram plate member operative, in its reciprocative movement, to compact trash fed through said chute into said dolly bin, and means controlled by said ram plate reaching its uppermost position in a cycle of reciprocative motion of said ram for tipping the forward end of said ram plate angularly upwardly to minimize obstruction to the passage of refuse fed through the top of said chute into said bin, said ram plate, when in its uppermost position in a cycle of reciprocative motion of said ram, being at a position intermediate the upper end of said dolly bin and the top opening of said chute, said means for tipping the foreward end of said ram plate angularly upwardly comprising a pair of ram slide bar cylinders extending vertically from the upper end of said main compactor, a pair of slide bars slidingly disposed, one each, in said slide bar cylinders, means pivotally connecting lower end portions of said slide bars with respect to laterally-opposed, rear portions of said ram plate member at the upper side thereof, means pivotally journalling the lower end of said hydraulic piston ram to a central portion of the upper side of said ram plate member, a cam member fixed with respect to and between said ram slide bar cylinders, and a cam follower fixed with respect to said lower end of said hydraulic cylinder piston rod and cooperative with said cam member for rotating said ram plate about said pivotal connection with said ram slide bars when in uppermost positions in their respective ram slide bar cylinders until said slide bars and said hydraulic cylinder piston rod are in substantially parallel relative disposition and said flat ram plate lies in a substantially horizontal plane.

4,130,055
ASSEMBLY FOR CLEANING AND PACKING CURED TOBACCO
Marvin A. Langley, Rte. 1, Box 382, Fountain, N.C. 27829
Filed Aug. 23, 1977, Ser. No. 826,990
Int. Cl.[2] B30B *1/32*
U.S. Cl. 100—91 **9 Claims**



1. A unit for packing cured tobacco leaves on a tobacco sheet, said unit including:
(a) a forming member having upper and lower limits positioned on the tobacco sheet, the tobacco leaves being placed into the forming member
(b) said forming member being provided with diametrically opposed slots proximate the upper limit of the member
(c) a compressing member mounted proximate said forming member
(d) said compressing member being provided with slidable locking members partially movable through the opposed

slots of said forming member for selectively locking the compressing member and forming member together, and

(e) power means engaged with said compressing member for urging the latter into packing engagement with the tobacco leaves within said forming member when said compressing member and forming member are disengaged from each other

(f) said power means being operative to enable said forming member and compressing member to be lifted as a unit from the packed tobacco leaves when said members are in locking engagement.

4,130,056

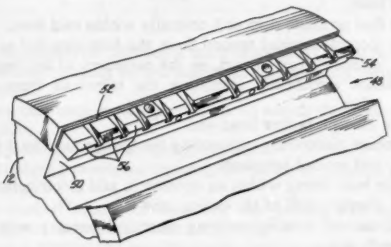
LITHOGRAPHIC MOISTURE SYSTEM AND METHOD

Saied A. Mabrouk, Macedonia, and Edward T. Morgan, Mentor, both of Ohio, assignors to Addressograph-Multigraph Corporation, Los Angeles, Calif.

Filed Aug. 1, 1977, Ser. No. 820,760

Int. Cl.[2] B41F *7/24*; B41L *25/00*

U.S. Cl. 101—141 **5 Claims**



1. In a lithographic duplicating apparatus having separate ink and moisture feed systems comprising roller trains;

cylinder means for retaining and holding a lithographic master in a predetermined area thereon in ink and moisture receiving relation with said feed paths;

moisture applying roll means associated with said moisture feed train for applying moisture to said master comprising an oleophilic surface capable of carrying moisture thereon;

moisture transfer roll means for feeding moisture to said moisture applying means;

means comprising oleophilic image portions for providing a continuous film of lithographic ink on said oleophilic surface;

means for positively driving said moisture applying roll in timed relation with the master cylinder of the duplicator;

means for applying to said transfer roll a retarding torque whose value varies monotonically with the speed of the rotation of the transfer roll;

said transfer roll being maintained in cooperating relationship with said moisture applying roll to form a nip therewith and being driven thereby through the layers of ink and moisture at said nip, and said relationship together with said means for applying said retarding torque controlling the surface speed of said transfer roll relative thereto and thereby the rate at which moisture is forwarded by said feed train;

the improvement comprising an ink reservoir in the form of an oleophilic band extending transverse the direction of said master cylinder in a location outside the master retention area for providing a supplemental source of ink for said moisture applying roll in addition to said oleophilic portions.

4,130,057

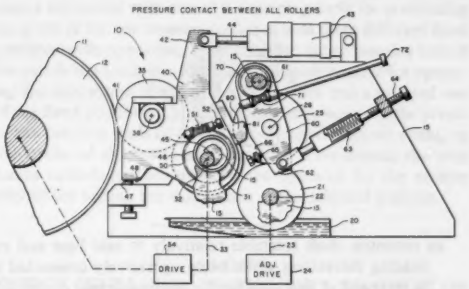
DAMPENING SYSTEM FOR PRINTING PRESSES, PARTICULARLY OFFSET PRINTING PRESSES

Klaus List, Wachtersbach, and Paul Abendroth, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG., Germany

Continuation-in-part of Ser. No. 844,907, Oct. 25, 1977, abandoned. This application Dec. 2, 1977, Ser. No. 856,635

Int. Cl.[2] B41L *25/16*

U.S. Cl. 101—148 **2 Claims**



1. In a dampening system for a printing press having a lithograph plate, plate cylinder and drive therefore, the combination comprising a frame, a fountain containing dampening fluid, a fountain roller, means for driving the fountain roller at a relatively slow speed, an intermediate roller, a distributor roller, means for driving the distributor roller at press speed, and a form roller, said rollers occupying working positions under normal running conditions in serial pressure engagement with one another for conveying a film of dampening fluid to the plate, means including a form roller throw-off lever pivoted to the frame and mounting the form roller for establishing a throw-off position for the form roller in which the form roller is totally disengaged from the plate and in which the form roller retains "kissing" contact with the distributor roller, means including an intermediate roller throw-off lever pivoted to the frame and mounting the intermediate roller for establishing a throw-off position in which the intermediate roller is totally disengaged from the distributor roller while retaining "kissing" contact between the intermediate roller and the fountain roller, an actuator having linkage coupling the same to both of the throw-off levers for moving them between respective working and throw-off positions, the linkage including sequencing means so that when the form roller and intermediate roller are restored by the linkage to their working positions contact is made last between the form roller and the plate, the pivots of the levers each having means providing limited orbital adjustment for adjusting the "kissing" contact to a substantially pressureless condition serving to ensure that during throw-off residual fluid on the surfaces of the rollers will be maintained in the form of an evenly distributed film free of contraction into droplets by reason of surface tension.

4,130,058

FASTENING BAR FOR SECURING PRINTING PLATES ON A PRINTING MACHINE

Erich Bock, Dürener Str. 5, 4600 Dortmund 1, Germany

Filed Feb. 18, 1977, Ser. No. 770,230

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606773

Int. Cl.[2] B41F *27/06*

U.S. Cl. 101—415.1 **15 Claims**

1. A clamping arrangement for a printing plate on a printing machine, said clamping arrangement comprising:

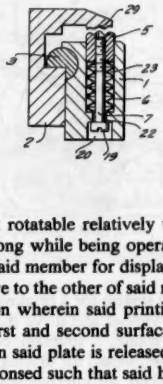
an elongated base;

at least one clamping bar mounted on said base and formed with a first clamping surface;

a plurality of clamping elements spaced along said base and

forming respective second clamping surfaces juxtaposed with said first clamping surface and movable relative to said base;

spring means bearing upon each of said clamping elements and yieldably biasing same for pressure equalization along an edge of a printing plate to be clamped between said first and second surfaces, said clamping bar constituting one member and said elements constituting another member of a pair of relatively movable members engaging said edge of said printing plate between them; and



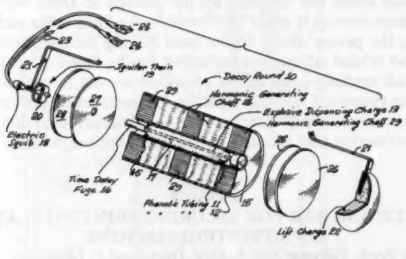
an eccentric shaft rotatable relatively to said base and extending therealong while being operatively connected to at least one of said member for displacing said one of said members relative to the other of said members between an engaged position wherein said printing plate is clamped between said first and second surfaces and a disengaged position wherein said plate is released, said recess having a depth dimensioned such that said head lies flush with a surface of said base in one limiting position of the respective element and engages a wall of said recess in another limiting position thereof.

4,130,059

DECOY MEANS AND METHOD THEREFOR

Kenneth A. Block, Claremont, and Leon J. Lader, Los Angeles, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Aug. 2, 1966, Ser. No. 570,140
Int. Cl.² F42B *13/42*
U.S. Cl. 102—34.4 **18 Claims**



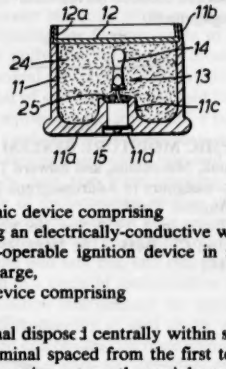
1. A decoy round comprising: at least one load of passive energy converting material, means for propelling said load, a burst charge for shattering said load, and means for igniting said burst charge, said passive energy converting material including at least some material composed of a multiplicity of dipoles having passive non-linear junctions therein and capable of reradiating frequencies transmitted by an associated active energy source while radiating frequencies which are not transmitted by an associated active energy source, thus giving the illusion of a plurality of independent energy sources.

4,130,060

PYROTECHNIC DEVICES

Dudley C. Murray, Salisbury, England, assignor to Pains - Wessex Limited, England

Filed Dec. 8, 1976, Ser. No. 748,415
Claims priority, application United Kingdom, Dec. 15, 1975, 51325/75
Int. Cl.² F42B *4/02*
U.S. Cl. 102—39 **12 Claims**



1. A pyrotechnic device comprising

a casing having an electrically-conductive wall,

an electrically-operable ignition device in said casing for igniting a charge,

said ignition device comprising

a base,

a first terminal disposed centrally within said base,

a second terminal spaced from the first terminal and located, at least in part, on the periphery of the base,

means electrically insulating the terminals from each other,

an electric igniter head and

means electrically connecting the igniter head to the first and second terminals,

the base fitting within an opening in said electrically-conductive wall of the casing, and

said second terminal making electrical contact with said wall, and

a plug of solid adhesive material disposed within the inner end of said opening and adhering to the base and the said wall of the casing to seal the base to said wall of the casing to prevent escape of gases therebetween, to prevent the ignition device from being ejected from the casing under the shock loading resulting from ignition of said charge and to relieve the ignition device from at least part of said shock loading.

4,130,061

GUN FIRED PROJECTILE HAVING REDUCED DRAG

Brian F. Boggs, West Simsbury, Conn.; Hector J. Zilcosky, Christiana, Pa., and William M. Smith, Simsbury, Conn., assignors to Ensign Bickford Company, Simsbury, Conn.

Filed Nov. 5, 1975, Ser. No. 628,970
Int. Cl.² F42B *13/14, 13/34*
U.S. Cl. 102—66 **16 Claims**

1. A fumer comprising a projectile having a base cavity therein and a pyrotechnic charge positioned within said cavity, said charge comprising about 30–55 percent by weight of an alkaline earth metal compound, about 20–35 percent by weight of a powdered metal fuel, about 20–50 percent by weight of a plasticized resin and about 10–30 percent by weight of an active oxidizer for said resin, said metal powder being present

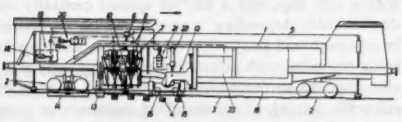
in greater than stoichiometric amounts relative to the amount of alkaline earth metal compound, said pyrotechnic composition being effective to provide rapid burning in the near wake area of the projectile resulting in a high specific impulse and fuel-rich combustion products.

4,130,062

APPARATUS FOR OBTAINING A CONTROLLED DEGREE OF BALLAST COMPACTION IN THE TAMPING AND LEVELING OF A TRACK

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Continuation-in-part of Ser. No. 556,177, Mar. 6, 1975, which is a continuation of Ser. No. 438,264, Jan. 31, 1974, Pat. No. 3,910,195. This application Apr. 12, 1976, Ser. No. 675,944
Claims priority, application Austria, Apr. 26, 1973, 3742/73
Int. Cl.[2] E01B *27/16*
U.S. Cl. 104—7 R **4 Claims**



1. Apparatus for leveling a track consisting of rails mounted on ties and tamping ballast thereunder, comprising the combination of

(1) a reference system in relation to which the track is leveled,

(2) jacking means for lifting the track,

(3) tamping means for tamping the ballast by vibratory pressure,

(4) control means for operating the jacking and tamping means, the control means including

(a) a control for simultaneously jacking and tamping the track, and

(b) a control for terminating track jacking before tamping has been completed.

(5) means in the region of the tamping means for holding the track in a position under the control of the reference system, and

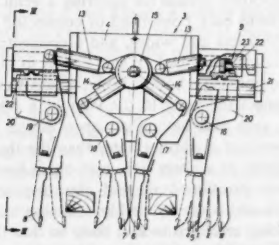
(6) means for locking the holding means in said position under the control of the reference system.

4,130,063

TAMPING HEAD

Josef Theurer, Vienna, and Wilhelm Praschl, Linz-Urfahr, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 707,946, Jul. 23, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,488
Claims priority, application Austria, Sep. 16, 1975, 7101/75
Int. Cl.[2] E01B *27/20*
U.S. Cl. 104—12 **8 Claims**



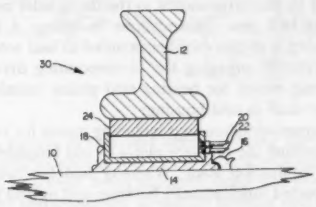
1. In a tamping head for tamping ballast underneath a track including rails supported on a plurality of spaced ties resting on the ballast and defining cribs therebetween, which comprises a pair of tamping tools, a vertically adjustable carrier whereon the tamping tools are mounted for immersion in the ballast in the cribs adjacent respective ones of the ties, the ties being positioned between the tamping tools, each tamping tool being constituted by a lever pivotal in a substantially vertical plane extending in the direction of the track about a horizontal pivot extending substantially transversely to the track direction, power drive means for reciprocating the tamping tools about the pivots thereof and for vibrating the tamping tools, stop means associated with one of the tamping tools for positioning the pivot of the one tamping tool in at least three different fixed positions with respect to the pivot of the other tamping tool of the pair in the track direction, and a remote control for operating the stop means to move the stop means into a selected one of the fixed positions whereby the distance between the pivots of the tamping tools of the pair is changed without changing the stroke of the reciprocating power drive means, the stop means including a multi-step drive operated by the remote control for setting the stop means at the selected position.

4,130,064

ENERGY GENERATING SYSTEM FOR A ROADWAY OR RAILWAY

Phillip P. Bridwell, R.R. #1, P.O. Box 535, Anna, Ill. 62906

Filed Dec. 20, 1976, Ser. No. 752,612
Int. Cl.[2] F04B *9/00*
U.S. Cl. 104—154 **12 Claims**



1. A railway track energy generating system comprising:

a rail bed comprising a plurality of cross ties,

an elongated rigid rail base secured to said cross ties and being supported thereon,

an elongated vehicle supporting rail located above said rail base and being generally coextensive therewith, said rail and rail base having sufficient strength and rigidity to support a train passing thereover,

a plurality of piston and operating cylinders mounted underneath said rail between said rail and rail base.

working fluid in said cylinders,

said pistons being secured to one of said rail and said rail base and said cylinders being secured to the other of said rail and said rail base,

said rail being completely supported and spaced from said rail base by the working fluid in said cylinders,

a portion of said piston and cylinders being positioned between adjacent ones of said cross ties and the remainder of said piston and cylinders being positioned above respective said cross ties,

return line means for supplying the working fluid to said cylinders,

means for pressurizing the working fluid within said return line means,

an outlet fluid line communicating with said cylinder,

valve means associated with said return line means and said outlet line for permitting fluid flow only into said cylinders through said return line means and only out of said cylinders through said outlet line, and

a fluid motor operatively connected to said output line.

4,130,065

DUAL AXLE RAILWAY DRIVING TRUCK

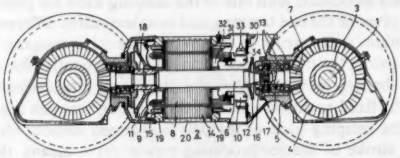
Roman Susdorf; Ulrich Schüler, and Heinz Engelmann, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 24, 1976, Ser. No. 669,805

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2514265

Int. Cl.[2] B61C *3/00, 9/50, 9/52;* H02K *1/17*

U.S. Cl. 105—135 6 Claims



1. A drive for a track-bound propulsion vehicle equipped with two drive axles comprising:

an electric drive motor disposed between the two drive axles and having a stator and a rotor equipped with a rotor shaft;

said stator including: a lamination stack, tension members arranged at the surface of said stack facing away from said rotor for tension holding said stack and pressure plates arranged at the respective longitudinal ends of said lamination stack for holding the same therebetween;

gear transmissions for transferring the torque energy developed by the drive motor to the drive axles respectively;

each of said gear transmissions including: a transmission housing, a pinion member coupled to said rotor shaft and operatively engaging the corresponding drive axle, and bearing means for bearing said pinion member and said rotor shaft in said housing;

said transmission housings including means for engaging and supporting the pressure plates at said longitudinal ends of said lamination stack, whereby said lamination stack is supported longitudinally between and by said transmission housings;

and at least one centering coupling means, said coupling means being disposed between one of said bearing means and the corresponding end of the rotor shaft for slidably connecting the one pinion member associated with that one bearings means to said corresponding rotor shaft end to permit a longitudinal displacement of the rotor shaft relative to said one pinion member.

4,130,066

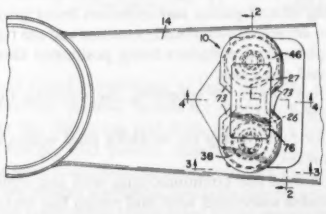
FRICTION SIDE BEARING ASSEMBLY

Harry W. Mulcahy, Griffith, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed May 16, 1977, Ser. No. 797,519

Int. Cl.[2] B61F *5/14, 5/24;* F16C *17/04, 27/02*

U.S. Cl. 105—199 CB 4 Claims



1. A side bearing assembly for use with a railroad car truck having a truck bolster and a car body bolster of a railroad car supported thereby, said assembly comprising,

two spaced spring means each having a selective width dimension less than one half of a width of said bolster,

a base disposed for mounting to said truck bolster with the longitudinal axis of said base positioned substantially perpendicular to the longitudinal axis of said truck bolster and mounting means formed within said base and proximately aligned with said base longitudinal axis, said base having shallow pockets at each of its longitudinal extremities for receiving one end of one of said spring means respectively so as to retain said spring means within said base, said base further having a centrally located upstanding projection having a substantial cross-sectional area, and sidewalls about said base having angularly and laterally disposed surfaces partially enveloping said spring means, with inner end portions of said sidewalls joining said projection,

a cap having shallow pockets at each of its longitudinal extremities for receiving an opposite end of one of said spring means respectively so as to retain said spring means within said cap, and a pair of spaced centrally located downwardly depending members which co-operatively interengage said projection of said base, said cap further being provided with sidewalls having angularly and laterally disposed surfaces with an inner end portion of said sidewalls joining said depending members to co-operatively interengage similar surfaces on said base during horizontal movement of said base with respect to said cap,

wherein downward vertical movement of said cap is limited by engagement with said base projection, horizontal movements of said cap with respect to said base is limited by interengagement between said inner end portions of said side walls of said base and cap, and said angularly and laterally disposed surface of said base and cap side walls allow said spring means to remain readily observable for inspection purposes.

4,130,067

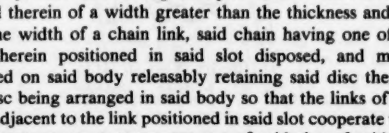
VEHICLE TIE-DOWN HOOK ASSEMBLY FOR RAILWAY CARS

Donald C. Kilgus, deceased, late of Grosse Point Woods, Mich., and by Marjorie M. Kilgus, executrix, 1288 Fairholme Rd., Grosse Point Woods, Mich. 48236

Division of Ser. No. 703,594, Jul. 8, 1976, Pat. No. 4,044,691. This application May 9, 1977, Ser. No. 795,402

Int. Cl.[2] B61D *45/00;* F16B *35/00, 37/00;* F16G *15/00*

U.S. Cl. 105—368 R 3 Claims

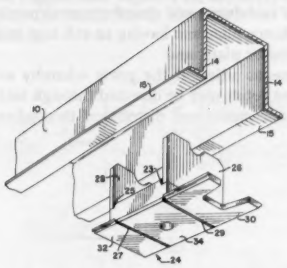


1. In a tie-down system for securing a vehicle to a rail car, tie-down chains each comprised of connected links of predetermined thickness and width, and a connector assembly for releasably connecting each of said chains to said vehicle, said assembly comprising a hollow body, means on said body operable to connect the body to the vehicle, a disc positioned in said body, said disc having an open ended transverse slot formed therein of a width greater than the thickness and less than the width of a chain link, said chain having one of the links therein positioned in said slot disposed, and means mounted on said body releasably retaining said disc therein, said disc being arranged in said body so that the links of said chain adjacent to the link positioned in said slot cooperate with said disc to prevent movement out of said slot of said link positioned therein.

4,130,068
CENTER FILLER FOR RAILWAY CARS

Marvin Stark, Houston, Tex., and Steve L. Suvada, Michigan City, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Feb. 13, 1978, Ser. No. 877,145
Int. Cl.[2] B61F *1/08, 5/16*
U.S. Cl. 105—420 4 Claims



1. In a railway vehicle having an underframe comprising body bolsters extending transversely from a longitudinally extending center sill, said center sill having spaced side webs and bottom flanges extending outwardly from each side web, the improvement comprising:

a center filler;

said center filler including lug means;

said lug means including means for abutting and interconnecting the spaced side webs of the center sill;

said lug means having a bottom surface in a plane with the bottom of each bottom flange of the center sill;

said lug means having a top surface spaced a first distance from the bottom surface;

weld means attaching the lug means to the center sill;

bottom plate means with means abutting said lug means;

second weld means attaching the bottom plate means with said lug means and with said center sill webs;

said bottom plate means having a lower surface in a plane with the bottom surface of said lug means and having a top surface spaced from the bottom surface a second distance;

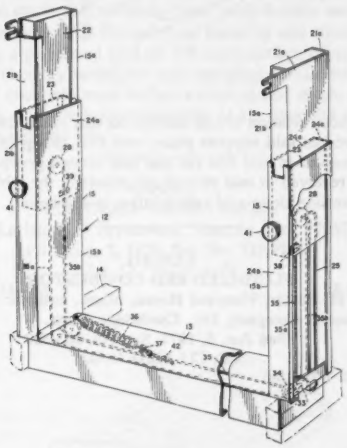
said first distance of the lug means being in the range of three to five times the second distance of the bottom plate means.

4,130,069
VERTICALLY-ADJUSTABLE TWO-POST DRAFTING TABLE

David F. Evans, and Leonard J. Yindra, both of Manitowoc, Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 744,520, Nov. 24, 1976. This application Mar. 3, 1978, Ser. No. 883,057
Int. Cl.[2] A47B *9/02*
U.S. Cl. 108—136 3 Claims

1. A table including a base having a hollow horizontal beam and a pair of hollow upstanding columns at opposite ends of said beam, each column comprising upper and lower column sections, said lower sections being secured to said beam adjacent their lower ends, a table top carried by said upper sections, said upper sections being vertically slidable between raised and lowered positions for selected adjustment of the elevation of said top, and means for synchronizing the movement of said upper sections and for counterbalancing said upper sections and said top carried thereby, said means including a cable extending in an endless loop through said beam and upwardly into each of said columns, guide means disposed within each of said columns and within said beam for supporting and guiding movement of said loop of cable, said loop having a pair of vertically-extending stretches disposed within each of said columns and movable in opposite vertical directions as said loop of cable is moved, spring means in said base connected to said cable and base for urging said loop of cable in one direction, securing means in each of said upper column sections for securing said sections to those stretches of cable in said columns urged upwardly by said spring, whereby, said cable synchronizes movement of said upper sections to maintain said top in level condition while said spring means acting through said cable counterbalances the weight of said upper sections and top, said guide means comprising pulleys mounted in said beam and said column, and stalks extending upwardly within said lower column sections and into said upper column sections, said pulley mounted within said columns being rotatably supported by said stalks at the upper ends thereof, at least



one of said pulleys within said columns being carried by a horizontal shaft extending through a vertically-elongated slot in said stalk, said shaft being movable along said slot to vary the tension of said cable, and means for holding said shaft in a selected position of adjustment along the length of said slot, said last-mentioned means comprising an angle member disposed adjacent the upper end of said stalk, said angle member including a vertical arm having an opening through which said shaft extends and also having a horizontal arm with an opening therein, and an adjustment screw extending through the opening of said upper arm and threadedly received by said stalk, said screw being provided with means engagable with said angle member for shifting said member when said screw is rotated.

4,130,070
LINEARLY TRANSLATABLE TABLE TOP

Cline E. Herrin, 1666 Dike Rd., Mount Vernon, Wash. 98273

Filed Dec. 8, 1977, Ser. No. 858,736
Int. Cl.[2] A62B *35/00*
U.S. Cl. 108—143 8 Claims

1. For use with a table having a base, a fixed horizontal support plate mounted on the base and a planar table top overlying the support plate, an apparatus for mounting the table top on the base so as to permit linear translation of the table top relative to the base, comprising:

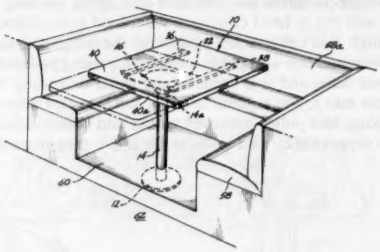
a base plate;

first means for affixing said base plate to the horizontal support plate;

a plurality of rollers mounted on a first surface of said base plate, each of said rollers having an axis of rotation substantially orthogonal to said first surface, said rollers being arranged in a first and a second group, the rollers of the first group being aligned so that their axes of rotation describe a first line and the rollers of the second group

being aligned so that their axes of rotation describe a second line, said first and second lines being in parallel spaced relation to one another; and,

a first elongate rail and a second elongate rail to be affixed to a first surface of the table top is substantially parallel



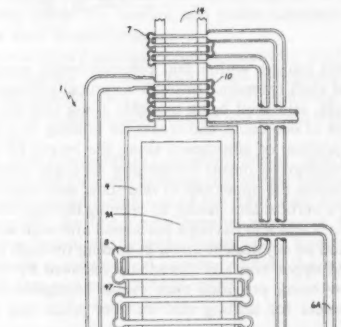
spaced relation to one another so that when the table top overlies said support plate, said first group of rollers is received in said first rail and said second group of rollers is received in said second rail whereby the table top can translate along said rails relative to the base.

4,130,071

FLUIDIZED-BED COMBUSTOR

James H. Porter, Vineyard Haven, Mass., assignor to Energy Resources Company, Inc., Cambridge, Mass.

Filed Jun. 6, 1977, Ser. No. 803,580
Int. Cl.[2] F23D *19/02*
U.S. Cl. 110—245 **12 Claims**



1. A method of feeding one or more particled solids into a fluidized-bed combustor comprising,

introducing the solid particles into one or more open-top ducts beneath the distributor plate of the fluidized bed,

injecting high velocity gas into the ducts at one or more ports spaced along the bottom of the ducts so as to entrain the particled solid in a gas stream, and

guiding the gas and entrained solids upwardly through and out of at least one chamber passing through the distributor plate and having an exit into the fluidized bed at a point above the distributor plate, so that the solid is evenly distributed throughout the bed.

7. Apparatus for feeding one or more particled solids into a fluidized bed having a distributor plate, comprising:

at least one open-topped duct located beneath the distributor plate and having an opening at one end for receiving the particled solid,

means for moving the particled solids into and through said duct,

at least one port in the bottom of each duct for injecting gas into said duct, whereby the solids may be entrained into the gas stream,

at least one chamber means communicating with the open top of said ducts, said chamber means passing through said distributor plate and having an exit into said bed above the distributor plate, and

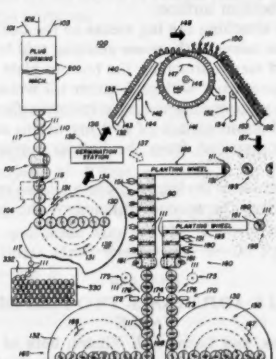
guide means adjacent the ports whereby said gas and entrained solids may be directed through said ducts and said chamber means and distributed throughout the fluidized bed.

4,130,072

FIELD TRANSPLANT SYSTEMS AND METHODS AND COMPONENTS THEREOF

Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.

Filed Feb. 25, 1977, Ser. No. 772,094
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.
Int. Cl.[2] A01C *11/00*
U.S. Cl. 111—2 **20 Claims**

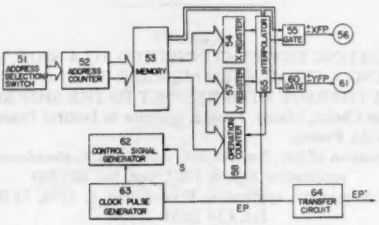


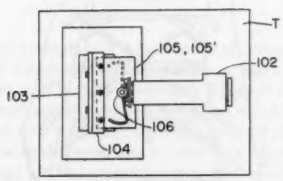
1. A field transplant production and planting system comprising mechanism for forming polymerized soil plugs each including a body of spongy open-celled hydrophilic polymer with a quantity of particles of soil mix distributed throughout said body of spongy polymer, a quantity of foam-forming synthetic organic plastic resin being reacted in situ to form said body of spongy open-celled hydrophilic polymer binding said particles of soil mix therein and into a plug, said soil mix comprising from about 20% to about 80% by dry weight of said soil plug, means for establishing a plant of transplant size in each soil plug so as to incorporate the roots of the plant therein, and planting mechanism for said soil plugs utilizing the soil plugs to move said soil plugs with the plants therein to a growing position in a field with said soil plugs essentially buried in the soil of the field and the plants growing upwardly therefrom.

4,130,073
AUTOMATIC SEWING MACHINE

Koya Kimura, Numazu; Shinji Machi, Mishima, and Shigetugu Matunaga, Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 771,265, Feb. 23, 1977, abandoned. This application Aug. 19, 1977, Ser. No. 826,072
Claims priority, application Japan, Feb. 25, 1976, 51-19619
Int. Cl.[2] D05B *21/00;* B23C *1/16*
U.S. Cl. 112—121.12 5 Claims



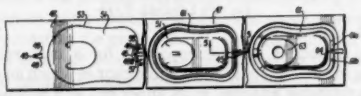


1. An automatic sewing machine comprising a movable head including a cloth clamping member for clamping a piece of cloth to be sewed to said movable head and provided with a profile corresponding to a predetermined sewing pattern, a memory device including a plurality of addresses for storing data concerning said sewing pattern and rectangular coordinate data for working an opening corresponding to a working origin on a blank of the cloth clamping member, electric drive means controlled by an electric signal read out from said memory device for moving said movable head at a predetermined speed thereby sewing said piece of cloth accoring to said sewing pattern, a work tool mounted on said sewing machine, means for mounting said blank of the cloth clamping member on said movable head at a position to be worked by said working tool, a pin adapted to be inserted into said opening for determining the sewing operation starting point, and means for driving said electric drive means at a speed lower than said predetermined speed, thereby working said blank to have said profile.

4,130,074
TAB SYSTEM

Daniel F. Cudzik, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Dec. 29, 1977, Ser. No. 865,447
Int. Cl.[2] B21D *51/44*
U.S. Cl. 113—121 R 10 Claims



1. A method of making a tab of the type attachable to an easy-open container wall to open a tear panel of the container wall wherein the tab includes a body having a lifting portion movable away from the container wall and an attachment portion for fastening said tab to the container wall, said method including the steps of:

providing a strip of sheet metal material;

forming in said strip of sheet metal material a stitch, said stitch remaining attached to said strip of sheet metal material at opposite ends thereof, but being severed from said strip of sheet metal material along opposite sides thereof;

cutting in said strip of sheet metal material a tab-body blank having an outer periphery, an inner surface, an outer surface, a forward end and an other end, the cut forming said tab-body blank extending uninterruptedly from a starting point immediately adjacent one side of said stitch to a finishing point immediately adjacent the opposite side of said stitch, said tab-body blank being thereby integrally connected to said strip of sheet metal by said stitch;

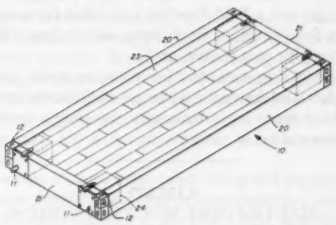
forming a peripheral curl on the inner-surface of said tab-body blank by curling the outer periphery of said tab-body blank onto said inner-surface except at said stitch; and,

severing said stitch approximately at the junction of said stitch and said tab.

4,130,075
PORTABLE CARGO DECKS

David G. Larive, 7707 Bryonwood, Houston, Tex. 77055

Filed Sep. 2, 1976, Ser. No. 719,919
Int. Cl.[2] B63B *3/48*
U.S. Cl. 114—85 8 Claims



1. In a cargo vessel having a hold which allows lift spreaders therein for the movement of cargo or containers comprising

(a) a portable deck;

(b) movable pin means removably connected to said portable deck for securing or releasing said portable deck in said hold by moving from a 1st position to a 2nd position in said deck;

(c) a drive means connected to said movable pin means for movement of said movable pin means;

(d) a detaining means movable connected to said deck and positioned adjacent said movable pin means for preventing inadvertent movement of said movable pin means from said 1st and 2nd position;

(e) lost motion means connected to said drive means for retracting said detaining means from said movable pin means prior to movement of said pin means by said drive means.

4,130,076
SINGLE POINT MOORING APPARATUS

Ben H. van Bilderbeek, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.

Filed Mar. 17, 1977, Ser. No. 778,483
Int. Cl.[2] B63B *21/00*
U.S. Cl. 114—230 4 Claims

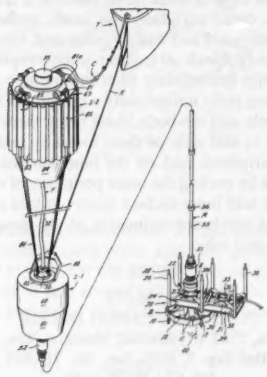
1. A single point mooring apparatus for mooring a ship and conducting fluid thereto, comprising:

a guide base positioned on the ocean floor and connected to a pile embedded in the ocean bottom;

a hollow tubular conductor pipe extending upwardly from said base and connected thereto by a releasable connector;

a submerged buoy mounted with said conductor pipe adjacent its upper end;

a surface buoy connected to said submerged buoy by adjustable connector means for controlling the tension on said hollow tubular conductor pipe;



a flexible conduit connecting the upper end of said conductor pipe and a fluid flowline extending from said surface buoy for delivering fluids from said hollow tubular conductor pipe to a tanker; and

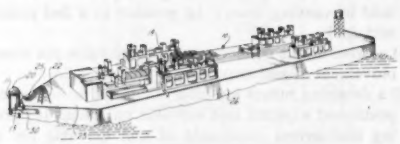
a rotatable ring mounted for rotation about said flexible conduit and having a yoke pivotally connected to said ring for receiving a hawse for mooring a tanker to said submerged buoy.

4,130,077

SINGLE-POINT MOORING SYSTEM

Abraham Person, Los Alamitos, and Yilmaz H. Ozudogru, Rancho Santa Fe, both of Calif., assignors to Global Marine, Inc., Los Angeles, Calif.

Filed Sep. 23, 1977, Ser. No. 836,068
Int. Cl.[2] B63B *21/00*
U.S. Cl. 114—230 **28 Claims**



1. Apparatus for mooring a structure floating in a body of water to an anchor point located above the water surface, comprising

a substantially rigid anchor structure fixed to the bottom of the body of water and extending above the water surface where it defines a right circular cylinder having a vertically disposed axis, the portion of the structure above the water surface comprising said anchor point,

a collar mounted to the cylinder circumferentially thereof for motion angularly about and axially along the cylinder,

a pair of rigid supports extending from the floating structure, the supports being spaced substantially equally from and on opposite sides of a roll axis of the floating structure, the spacing between the supports being greater than the diameter of the collar, and

resilient connections between the supports and the collar

(a) for locating the collar centrally between the supports in a normal state of the mooring apparatus,

(b) for affording and accommodating motions of the floating structure, as manifested at the supports, relative to the collar in horizontal linear directions and angularly about the roll axis in surge, sway and roll, and

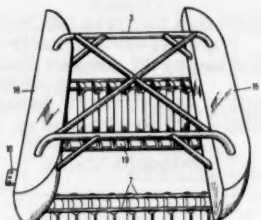
(c) for absorbing the forces manifested between the collar and the floating structure in association with the surge and sway motions, the collar moving on the anchor structure cylinder in response to pitch, heave and heading change motions of the floating structure.

4,130,078

FLOATING DEVICE CONNECTED TO A SHIP, FOR TOWING A SUBMERGED MEMBER WITH A LATERAL SHIFT THEREOF WITH RESPECT TO THE SHIP ROUTE

Jacques Cholet, Massy, France, assignor to Institut Francais du Petrole, France

Continuation of Ser. No. 646,846, Jan. 5, 1976, abandoned. This application Sep. 9, 1977, Ser. No. 831,989
Claims priority, application France, Jan. 6, 1975, 75 00384
Int. Cl.[2] B63B *21/56*
U.S. Cl. 114—244 **6 Claims**



1. In a device for shifting a submerged member towed from a ship with respect to the moving direction of said ship, which comprises floating means, and submerged deflector means fixed to said floating means, said deflector means including a plurality of parallel paddles curved in the same direction, each having a generatrix perpendicular to the plane of flotation, the improvement comprising said paddles being arranged in two assemblies respectively placed at the head and at the rear of said floating means, and said floating means comprising two elongated floating members, each having a longitudinal cross-section with a curved segment at one side thereof, the respective chords of said segments extending along a direction parallel to the longitudinal axis of said floating means, and the curvatures of said curved segments being oriented in the same direction as the curvature of said paddles.

4,130,079

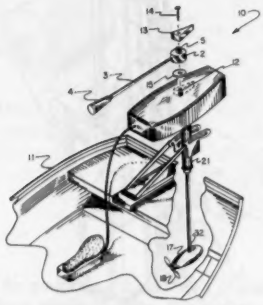
AUXILIARY STEERING CONTROL FOR ELECTRIC TROLLING MOTOR

William F. Rhorer, 5961 Stoneshire, Baton Rouge, La. 70805, and Joseph V. Zito, 855 Princewood Ct., Baton Rouge, La. 70806

Filed Jun. 13, 1977, Ser. No. 806,173
Int. Cl.[2] B63H *5/12*
U.S. Cl. 115—18 E **2 Claims**

1. In a steering control apparatus for a rack and pinion steering mechanism of an outboard motor in which an elongate shaft is rotatably attached at its upper end to a hollow casing, which is fixedly attached to a boat, and at its lower end is fixedly attached to a motor housing containing an electric motor which drives a propeller transversely of said shaft, said shaft having a hollow first pinion mounted thereon which is

continuously in mesh with a sliding rack operatively connected by a control cable to a foot pedal actuator so that operation of the foot pedal causes the elongate shaft to turn, thereby steering the boat, and a second pinion also continuously engaged with the sliding rack and carrying a direction-indicating pointer, the improvement comprising an auxiliary steering apparatus including a coupling means attached to said second pinion in the shape of a cylindrical collar having a flange for attachment of said direction-indicating pointer at its upper end,



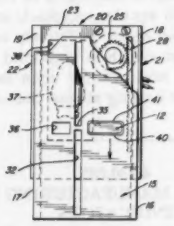
an axial bore through said flange and said collar ending at its lower end in a socket, opposite said flange, and having a larger diameter than said bore for receiving the shaft of said second pinion and said coupling means having a tapped socket axially transverse of said bore for receiving one end of an auxiliary control rod whereby upon loss of control or failure of said foot pedal actuator or said control cable, said control rod is attached to said tapped socket for receiving one end of said control rod in said coupling means for temporary manual steering control.

4,130,080

INDICATING CONTROL STRUCTURE

Lawrence C. Lotz, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 31, 1977, Ser. No. 801,835
Int. Cl.[2] G09F *9/40;* H01C *10/32*
U.S. Cl. 116—2 **7 Claims**



1. In a control structure for concurrently rotating a rotatably adjustable mechanism and indicating the adjusted disposition of the mechanism, including a slider having a manipulating handle, means for guiding the slider reversibly along a preselected path in said control structure, and drive transmission means for rotating the mechanism to a desired adjusted disposition as a result of a corresponding movement of the slider along said path, the improvement comprising

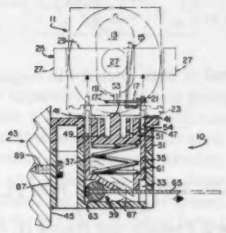
indicator means for indicating the disposition of said slider in said path and resultingly the adjusted disposition of the mechanism including means defining an integrally formed window movable with said slider and indicia means disposed adjacent said path to be selectively exposed by said window for indicating said disposition.

4,130,081

ACTIVATION MEANS FOR FLASHLAMP ARTICLE

Ronald G. Blaisdell, Saugus; Harold H. Hall, Jr., Marblehead, and Harold L. Hough, Beverly, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jun. 6, 1977, Ser. No. 803,563
Int. Cl.[2] G08B *7/08, 3/14*
U.S. Cl. 116—5 **21 Claims**



1. Activation means for activating at least one flashlamp unit located within a flashlamp article including a base portion, said activation means comprising:

a casing defining a chamber therein, said casing adapted for having said base portion of said flashlamp article positioned thereon;

an activator member movably oriented within said chamber of said casing for occupying a first, non-firing position and a second position therein and including at least one upstanding engagement member thereon, said activator member effecting firing of said flashlamp unit within said flashlamp article when said article is positioned on said casing and said activator member occupies said second position;

biasing means located within said casing and engaged to said activator member, said biasing means continuously biasing said activator member toward said first, non-firing position for returning said activator member thereto subsequent to said firing of said flashlamp unit;

engagement means movably positioned within said chamber for engaging said activator member to effect movement of said activator from said first position to said second position, said engagement means effecting said movement in response to external actuation thereof; and

means for securing said activation means to an external surface.

4,130,082

FLASHLAMP ASSEMBLY FOR PROVIDING HIGHLY INTENSE AUDIBLE AND VISUAL SIGNALS

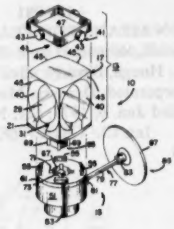
Andre C. Bouchard, Peabody; Harold H. Hall, Jr., Marblehead; Robert J. Patton, Westford, and Thomas J. Sentementes, Wakefield, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jun. 6, 1977, Ser. No. 803,565
Int. Cl.[2] G08B *3/14, 7/08*
U.S. Cl. 116—5 **42 Claims**

1. A combustible member for use with a flashlamp article including at least one flashlamp unit therein, said flashlamp unit including at least one flashlamp, said combustible member comprising:

at least one pyrotechnic device including a container, a quantity of pyrotechnic mixture within said container, and sealing means for hermetically sealing said pyrotechnic mixture within said container separately from said flashlamp unit, said pyrotechnic device adapted for being located externally of and in operative relationship to said

flashlamp of said flashlamp unit to receive energy therefrom in the form of light and/or heat and provide an



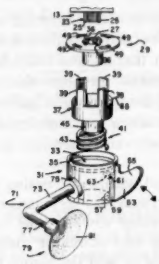
audible signal of high intensity in response to receipt of said energy.

4,130,083

ACTIVATING MECHANISM FOR FLASHLAMP ARTICLE

Andre C. Bouchard, Peabody, and Harold H. Hall, Jr., Marblehead, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jun. 6, 1977, Ser. No. 803,564
Int. Cl.[2] G08B *7/08, 17/02, 13/08*
U.S. Cl. 116—114.5 **25 Claims**



1. Activation means for activating a plurality of flashlamp units located within a flashlamp article wherein each of said units comprises a percussively-ignitable flashlamp and prestressed striker spring associated therewith, said activation means comprising:

a casing defining a chamber therein;

seating means located at one end of said casing for having said flashlamp article positioned thereon;

an activator member movably oriented within said chamber of said casing to occupy first and second positions therein, said activator member including as a portion thereof a plurality of upstanding engagement members, said engagement members engaging said prestressed striker springs to effect release thereof and cause firing of said flashlamp units when said flashlamp article is positioned on said seating means and said activator member occupies said second position, the direction of movement of said activator member being linear;

means operatively connected to said activator member within said chamber for effecting movement of said activator member from said first position to said second position;

means for retaining said activator member in said first position and effect release thereof in response to actuation by means external of said activation means; and

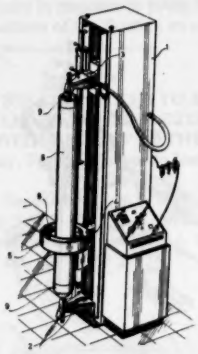
means for securing said activation means to an external surface.

4,130,084

COATING APPARATUS

Hermanus Josephus Eduardus J. M. Hoelen, Nijmegen, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Jul. 18, 1977, Ser. No. 816,877
Claims priority, application Netherlands, Jul. 23, 1976, 7608241
Int. Cl.[2] B05C *3/02*
U.S. Cl. 118—59 **2 Claims**



1. An apparatus for coating a thin-walled perforated cylinder, particularly a screen stencil, with a photo-sensitive liquid layer comprising a vertical support column, a stationary lower mounting head attached to said support column, an upper mounting head adjustable for height along said column above said lower head, a carriage slidable along said column between said mounting heads, an annular receptacle attached to said carriage and movable therewith, the center of said annular receptacle coinciding with the center lines of both mounting heads, a drive means on said column for moving said carriage at a constant speed up and down along said column between said mounting heads, a pair of detachable accessory parts each having two conical ends, one conical end of each accessory part receiving a separate end of a said perforated cylinder and means projecting from the other conical end of each accessory part being mounted on an associated one of said mounting heads, said one conical end having a projecting means adapted to detachably mount on the second of said heads whereupon the said other conical end is adapted to be received by a said perforated cylinder, said annular receptacle comprising a reservoir for said liquid and being operatively associated with a said perforated cylinder which is supported by said pair of parts whereby to coat said cylinder upon movement of the carriage, and means for heating at least one of said mounting heads.

4,130,085

APPARATUS FOR MANUFACTURING SPOT TEST INDICATORS

Raymond Hewitt, Stanhope, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed May 11, 1977, Ser. No. 795,956
Int. Cl.[2] B05C *5/02*
U.S. Cl. 118—315 **7 Claims**

1. Apparatus for applying a predetermined pattern of an aqueous liquid containing a chemical indicator reagent to a flat, moving sheet having a hydrophobic surface, whereby a constant volume of the liquid is deposited on a constant area of the hydrophobic surface, which comprises;

a fixed platen having a flat surface to support a sheet traveling thereover;

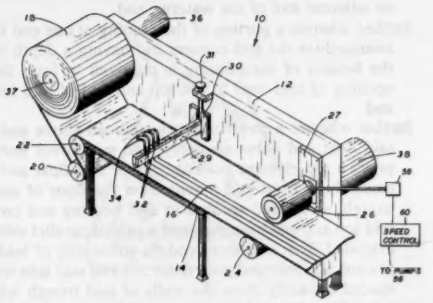
means for feeding a flat sheet to the surface of said platen;

means for drawing the sheet across the surface of said platen

at an adjustable, fixed speed of from about 5 to about 20 feet per minute and within 1 percent of the set fixed speed;

a header for mounting a plurality of liquid dispensing nozzles over the surface of said platen, said header being adjustable in a vertical plane and adapted to hold in a rigid position a plurality of said nozzles;

a plurality of liquid dispensing nozzles mounted in said header;



means for positioning the plurality of nozzles in the header a uniform distance above the surface of the platen and above the flat sheet drawn across the surface of the platen so that there is a gap between the moving sheet and the nozzles, said nozzles being set as close to the moving sheet as physically possible; and

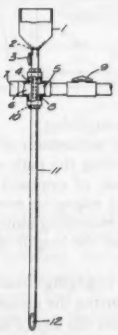
means for supplying to said nozzles an uninterrupted, pulse-free flow of the aqueous liquid reagent, at a constant volume rate of from about 2 to about 4 microliters per linear inch of the moving sheet.

4,130,086

FISH EGG PLANTING DEVICE AND METHOD

Tod A. Jones, Box 1288, Wrangell, Ak. 99929

Filed Jun. 14, 1977, Ser. No. 806,455
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **5 Claims**



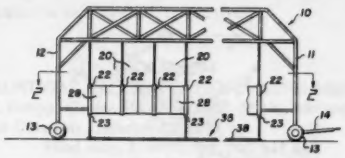
1. A fish egg planting device which comprises a receptacle for fertilized eggs, said receptacle having a valved orifice at its base through which the fertilized eggs may pass into a central chamber attached to said receptacle, said chamber having a lateral orifice to permit the entry of water, the flow of said water being governed by a control valve, and a rigid hollow tubing communicating with the base of said chamber, said tubing being adapted to permit insertion into the stream or lake bed substrates, such that the eggs are deposited in the stream or lake bed.

4,130,087

STARTING BAR ATTACHMENT FOR STARTING GATES

Samuel G. Dunn, 15039-68th Ave., Surrey, British Columbia, Canada (V3S 2B8)

Filed Jun. 7, 1977, Ser. No. 804,286
Int. Cl.[2] A01K *1/00*
U.S. Cl. 119—15.5 R **21 Claims**



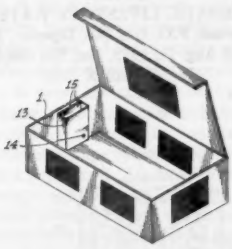
1. Starting bar apparatus for a starting gate structure divided by separators into a plurality of animalretaining stalls, each stall having a rear entrance end and a forward exit end, said bar apparatus comprising a starting bar extending across said stalls at ground level and adjacent the rear thereof, a plurality of downwardly-inclined rigid main links spaced from each other longitudinally of the bar and extending from the gate structure to said bar, said links being inclined forwardly in the direction of the forward ends of the stalls, and connectors connecting the upper ends and the lower ends of the links respectively to the gate structure and the starting bar, said connectors at the upper ends of the links comprising swivel means to allow the links to swing longitudinally and laterally of the stalls.

4,130,088

SHIPPING CAGE FOR FEEDING ANIMALS WATER FROM DISPOSABLE BAGS

Matthew Salvia, Cold Spring Rd., Stanfordville, N.Y. 12581

Continuation-in-part of Ser. No. 632,626, Nov. 17, 1975, Pat. No. 4,022,159, which is a continuation-in-part of Ser. No. 517,509, Oct. 24, 1974, Pat. No. 3,958,535. This application Mar. 11, 1977, Ser. No. 776,523
Int. Cl.[2] A01K *1/02, 9/00*
U.S. Cl. 119—19 **2 Claims**



1. A shipping cage made of laminated corrugated paper for feeding animals liquids while in transit (have) having a cover, receptacle means made of laminated corrugated paper secured to a wall within said cage,

a sealed plastic bag of liquid within said receptacle means,

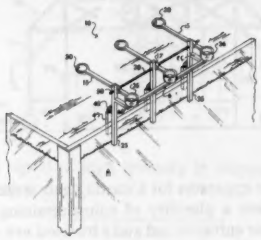
a feeding means having a demand feeding means at one end and a piercing point at the other end extending through said (wall) receptacle means and into the bag,

and integral (retaining means) spaced flanges intermediate the ends of the feeding means, one of the flanges being retained between the laminations of the receptacle means and the other abutting its wall through which the clemand feeding means protrudes to prevent withdrawal of the feeding means by the animals.

4,130,089
AUTOMATIC AQUARIUM FEEDING DEVICE

Daniel J. Moran, Box 5113, 3 W. Henderson St., Wrightsville Beach, N.C. 28480

Filed May 16, 1977, Ser. No. 797,033
Int. Cl.[2] A01K *1/10*
U.S. Cl. 119—51 R 4 Claims

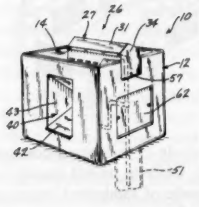


1. An apparatus for automatically and periodically dispensing food to aquatic animals in an aquarium, said apparatus comprising:
(a) a support means removably attached to a side wall of said aquarium;
(b) a balance arm having a first end and a second end, said balance arm being pivotally attached to said support means at a point intermediate said first and second end with at least said first end extending over the open top of the aquarium;
(c) a shallow bowl secured to said first end of said balance arm for holding a supply of food therein;
(d) a liquid containing cup having an open top and being secured to said second end of said balance arm for containing therewithin a preselected amount of liquid having an established rate of evaporation;
(e) in operation said first end of said balance arm being activated downwardly by gravity directly responsive to evaporation of said liquid from said second end whereby the food will spill from said bowl into the aquarium at a preselected time determined by the established rate of fluid evaporation.

4,130,090
AUTOMATIC LIVESTOCK WATERER

Orville R. Bohlmann, P.O. Box 344, Dension, Iowa 51442

Filed Aug. 21, 1975, Ser. No. 606,432
Int. Cl.[2] A01K *7/02*
U.S. Cl. 119—73 1 Claim

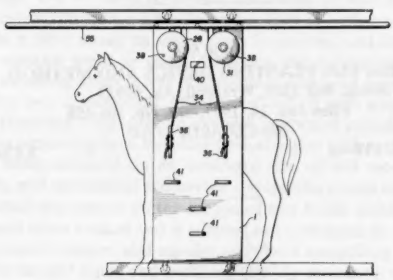


1. Livestock watering apparatus comprising:
a rectangular housing having formed in the upper portion thereof a first rectangular trough adapted to hold water, said housing having formed additionally therein a well, spaced from said first trough;
means for controlling the level of the water within said first trough, said means having a float located in said first trough, said means further including a plumbing assembly positioned in said well and fluidly connected to a source of water and to said float via a valve assembly, said valve assembly operated in response to the level of said float for maintaining a predetermined water level in said first trough;
further wherein said well is formed within one end of said housing, comprising a hollow interior area of said housing below the closed bottom of said trough, and comprising further a hollow area open to the top and to an adjacent end of the housing and forming thereby top and end openings, whereby the well is exposed from the top and from an adjacent end of the waterer; and
further wherein a portion of the housing at one end thereof intermediate the end corners and having a depth toward the bottom of the housing is removed to form the said opening of said well to the top and end of said housing; and
further wherein a cover unit is positioned above and about said float and valve assembly, and said cover unit comprises a top element positioned over said float and valve assembly, a front end mounted on the floor of said first trough, a rear end secured to said housing and covering said top and end openings, and a pair of parallel side walls extended from said front end on either side of said float, toward said rear end, said front end and said side walls all spaced inwardly from the walls of said trough whereby water in said trough surrounds said front end and said side walls.

4,130,091
ANIMAL WALKER

M. Theresa Knudson, 3900 16th St. NW., Washington, D.C. 20011

Filed Dec. 23, 1976, Ser. No. 753,891
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—102 8 Claims



8. An animal walker comprising
means for engaging the midsection of an animal,
track means for controlling the path of the walker,
a carriage having a pair of opposed vertical elements on opposite sides of said engaging means slidably engaging said track means and extending along the axis of said track means no greater than the length of the animal's midsection,
means connecting said engaging means to said carriage for restraining and supporting the animal in said carriage, and
a bumper extending from the top of said carriage along the axis of said track means beyond the length of the animal.

4,130,092
DUST BAG FOR ANIMAL INSECTICIDE

W. Scott Eshnaur, and Helen E. Eshnaur, both of 3207 Coronado, St. Joseph, Mo. 64505

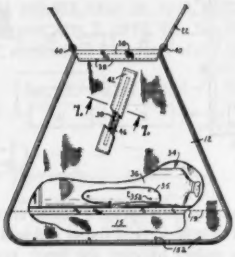
Division of Ser. No. 701,794, Jul. 1, 1976, Pat. No. 4,079,700.
This application Oct. 26, 1977, Ser. No. 845,629
Int. Cl.[2] A01K *13/00, 29/00*
U.S. Cl. 119—159 9 Claims

1. A dust bag arrangement for applying powdered insecti-

cide to animals and adapted to receive a waterproof cartridge containing said insecticide wherein the cartridge may be punctured to permit flow of insecticide, said arrangement comprising:

a first bag adapted to accommodate the flow of insecticide therethrough and having opposed side panels and a bottom portion;

a second bag disposed inside of the first bag and adapted to accommodate the flow of insecticide therethrough,



said second bag having opposed side panels located inwardly of the side panels of said first bag and also having a bottom portion located above the bottom portion of said first bag; and

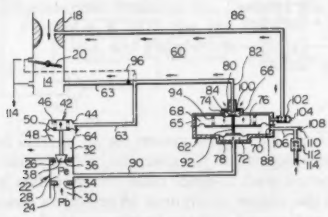
a pair of water resilient panels disposed between corresponding side panels of said first and second bags, said water resistant panels having lower edges which are spaced apart to present a space through which insecticide may pass from the bottom portion of said second bag to the bottom portion of said first bag.

4,130,093

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 12, 1977, Ser. No. 786,812
Claims priority, application Japan, Apr. 13, 1976, 51-41590
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **7 Claims**



1. An exhaust gas recirculation (EGR) control system in combination with an internal combustion engine including

an intake passage providing communication between the atmosphere and the engine and having

a venturi formed therein, and

an exhaust gas passageway providing communication between the engine and the atmosphere, said EGR control system comprising

an EGR passageway providing communication between the exhaust gas passageway and the intake passageway for recirculating thereinto exhaust gas emitted from the engine, said EGR passageway having provided therein

a restriction for restricting said EGR passageway;

an EGR control valve which is disposed in said EGR passageway downstream of said restriction to define a first chamber interposed between said restriction and said EGR control valve and is operable in opposite directions to increase and reduce the pressure of engine exhaust gas in said first chamber for controlling the flow of recirculated engine exhaust gas; and

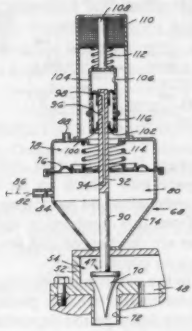
operating means for operating said EGR control valve in opposite directions to increase and reduce the exhaust gas pressure in said first chamber in accordance with a decrease and an increase in said exhaust gas pressure and in accordance with a decrease and an increase in a venturi vacuum in said venturi, respectively.

4,130,094

EXHAUST GAS RECIRCULATION VALVE ASSEMBLY

Karl H. Gropp, Grosse Pointe Woods, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 3, 1977, Ser. No. 821,442
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**



1. An engine exhaust gas recirculating (EGR) valve assembly, comprising in combination, a duct connecting engine exhaust gases to the engine intake manifold, an (EGR) valve movable into and out of the duct to block or permit flow of gases through the duct, a spring biasing the (EGR) valve into the duct to a closed position, fluid pressure actuated force means connected to the (EGR) valve for moving it to an open position against the forces of gases and manifold pressure acting in the duct on the valve, means connecting a source of varying pressure to the force means to actuate the same, a movable atmospheric bleed device movable to decay the pressure from the source below a level operative to effect opening of the (EGR) valve, and control means operably connected to the bleed device to move the same to control the decay of source pressure force, the force means including a servo having a diaphragm dividing the servo into an atmospheric pressure chamber on one side and a variable fluid pressure chamber on the other side, a valve stem connected to the (EGR) valve and to the diaphragm and projecting through the diaphragm from one side to the other, the bleed device including bypass passage means in the stem having an outlet opening into each chamber for decaying the pressure in one chamber to the level of the pressure in the other chamber, and rollable flexible seal means movable by the control means between a first position uncovering the outlet in one chamber to expose the latter outlet to atmospheric pressure to equalize the level of the pressures in the chambers to thereby permit movement of the diaphragm in a valve closing direction by the spring or movable to a second position to cover the latter outlet to permit a change in the force level of the pressure in the variable pressure chamber to effect an (EGR) valve opening movement of the diaphragm, the latter movement of the diaphragm moving the stem relative to the seal means to again uncover the latter outlet and again effect the movement of the diaphragm and stem and (EGR) valve in a valve closing direction, the valve moving back and forth until an equilibrium position is attained for each movement of the control means.

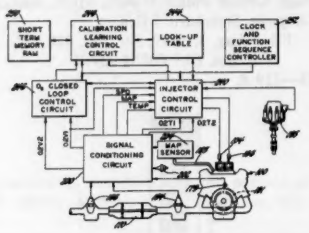
4,130,095
FUEL CONTROL SYSTEM WITH CALIBRATION LEARNING CAPABILITY FOR MOTOR VEHICLE INTERNAL COMBUSTION ENGINE

Lauren L. Bowler, Bloomfield Hills, and John E. Lahiff, Farmington, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 814,884, Jul. 12, 1977, abandoned. This application Dec. 1, 1977, Ser. No. 856,238

Int. Cl.[2] F02G *3/00*; F02M *7/00*

U.S. Cl. 123—32 EE **14 Claims**



1. A fuel control system for an internal combustion engine having combustion space into which an air/fuel mixture is supplied to undergo combustion and having means defining an exhaust gas passage from the combustion space into which spent combustion gases are discharged and are directed to the atmosphere comprising, in combination:

a sensor responsive to the oxidizing/reducing conditions at a predetermined point in the exhaust passage, and hence, after a transport time delay period dependent upon engine operating conditions, to the mixture supplied to the combustion space, the sensor having an output condition indicative of predetermined desired oxidizing/reducing conditions;

a memory having locations addressable in accordance with at least one engine operating condition and having a number at each such location determinative of a fuel supply rate as determined by the engine operating condition so as to produce the predetermined desired oxidizing/reducing conditions;

means effective to supply fuel to the combustion space at a rate determined at least by the number recalled from the memory at the location of the current value of the predetermined engine operating condition;

sampling means effective to sample and store at recurrent intervals at least the predetermined engine operating condition; and

means responsive to at least the engine operating condition stored by the sampling means at the beginning of a particular transport time delay period and to the output condition of the sensor at the end of the particular transport time delay period effective to store in the memory at the address according to the engine operating condition at the beginning of the particular transport time delay period a new number having a value differing from the value previously stored at such address in a sense tending to restore the sensor output to the desired output condition.

4,130,096
IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

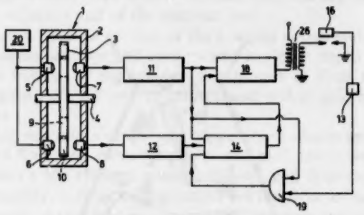
Eric H. Ford, London, England, assignor to Lumenition Limited, England

Division of Ser. No. 572,889, Apr. 30, 1975, abandoned. This application Oct. 6, 1977, Ser. No. 839,810

Int. Cl.[2] F02P *5/04*, *1/00*

U.S. Cl. 123—117 R **8 Claims**

1. An electronic ignition system including: means for generating a series of square wave voltage pulses whose mark space ratio is variable, one edge of said waveform always occurring at a fixed predetermined crank-shaft position, whilst the other edge is variable for the purpose of advancing or retarding the ignition; means for varying the mark space ratio of the generated square wave voltage pulses in response to engine requirements; means for deriving a signal from the second stage of combustion representative of a selected point on the pressure



rise curve; means operative from a timing comparison between the occurrence of said derived signal and said fixed edge of the square voltage pulses to vary the mark space ratio of said voltage pulses and hence the ignition timing so maintaining coincidence between said derived signal and the fixed edge of the square wave voltage pulses.

4,130,097
IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

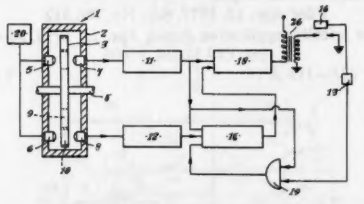
Eric H. Ford, 17, Kensington Gate, London, W.8., England

Continuation of Ser. No. 572,889, Apr. 30, 1975, abandoned. This application Oct. 17, 1977, Ser. No. 842,953

Claims priority, application United Kingdom, May 7, 1974, 20148/74

Int. Cl.[2] F02P *5/04*, *1/00*

U.S. Cl. 123—117 R **12 Claims**



1. An electronic ignition system for an internal combustion engine, including: means for generating a first series of square-wave, constant mark-to-space ratio voltage pulses in synchronism with the engine revolutions to provide a series of alternate first and second voltage levels; means for generating a second series of square-wave voltage pulses also in synchronism with the engine revolutions and at a fixed multiple of the first series of square-wave voltage pulses; means for counting a given number of the second series of voltage pulses from a predetermined point in relation to the first series of voltage pulses in order to initiate a signal for the production of the spark; means for sensing a predetermined point on the pressure rise curve after the commencement of the second stage of the combustion process in a cylinder of the engine at each firing cycle; means for deriving a digital signal from the sensing of the predetermined pressure point; means for digitally comparing the crank-shaft position corresponding to the said predetermined pressure point with a fixed predetermined crank-shaft position derived from said first series of voltage pulses; and digital means for advancing or retarding the ignition by subtracting or adding one pulse at a time to the given number of pulses of the second series to be counted, during each firing cycle, in order to maintain substantial coincidence between the

predetermined pressure point in the second stage of combustion and said fixed predetermined crank-shaft position irrespective of engine requirements.

4,130,098

METHOD AND APPARATUS FOR REDUCING THE TOXIC COMPONENTS IN EXHAUST GAS

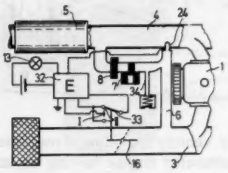
Ernst Linder, Mühlacker; Günter Wössner, Esslingen; Helmut Maurer, Schwieberdingen, and Franz Rieger, Wasseralfingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Division of Ser. No. 560,555, Mar. 20, 1975, Pat. No. 4,075,992. This application Aug. 3, 1977, Ser. No. 821,425

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1974, 2414761

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **8 Claims**



1. An apparatus for exhaust gas detoxication in an internal combustion engine which includes an induction tube, a throttle valve disposed therein and an exhaust manifold, comprising:

(A) an exhaust gas recycle line, connected to establish flow communication between the exhaust manifold and the induction tube of the engine;

(B) valve means, disposed within said recycle line for controlling the gas flow therethrough;

(C) sensor means, disposed within the exhaust manifold for generating signals related to gas conditions; and

(D) warning signal means, influenced by said sensor means for producing a warning signal, capable of being sensed and related to the gas flow in said recycle line.

4,130,099

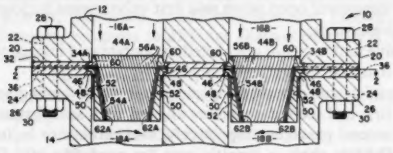
GAS SAVER

Russel O. Ferguson, 636 Richmond St., Dunedin, Fla. 33528

Filed Mar. 9, 1977, Ser. No. 775,975

Int. Cl.[2] F02M *29/00*

U.S. Cl. 123—141 **11 Claims**



1. A gasoline saving device for an internal combustion engine having a carburetor housing and a manifold housing, each housing having an internal orifice for passing a gasoline fluid, comprising in combination:

a substantially flat plate member adapted for insertion between the carburetor housing and the manifold housing;

said plate member comprising aperture means having a diameter in accordance with the cross-section of the internal orifices of the carburetor housing and the manifold housing;

means for registering said aperture means of said plate member relative to the internal orifices of the carburetor housing and the manifold housing;

a plurality of plate fluid channel means extending longitudinally through said plate member for providing fluid communication for an external fluid adjacent an outer surface of said plate member with said aperture means of said plate member;

venturi means established in proximity to said aperture means for drawing the external fluid through said fluid channel means into the internal orifice of the manifold housing upon gasoline fluid flow therein to mix the external fluid with the gasoline fluid;

said aperture means of said plate member including a first and a second aperture for cooperation with first and second carburetor and manifold internal orifices, respectively;

means for inducing a clockwise spin to the gasoline fluid in the first manifold internal orifice and for inducing a counterclockwise spin to the gasoline fluid in the second manifold internal orifice;

said substantially flat plate member including attachment means for securing said venturi means; and

sleeve means disposed within the internal orifice of the manifold and cooperating with said venturi means and said plate member for positioning said venturi means in the internal orifices of the manifold housing.

4,130,100

DIRECT-INJECTION SPARK-IGNITION ENGINE

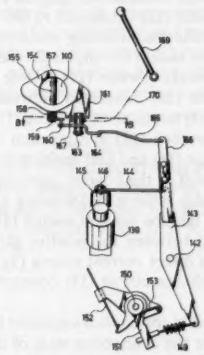
Shigeichi Okada, Owari-asahi, and Takeshi Katoh, Nagoya, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 23, 1976, Ser. No. 744,257

Claims priority, application Japan, Jan. 10, 1976, 51-1843; Jan. 16, 1976, 51-2493[U]

Int. Cl.[2] F02M *63/00*

U.S. Cl. 123—139 BG **5 Claims**



1. A direct-injection spark-ignition engine adapted to be coupled to a load including a governor having a power shaft for sensing the rotational speed of the engine, at least one fuel injection pump for injecting fuel at a rate which may be increased or decreased by a fuel control rack, a fuel control rack connected to the power shaft of said governor and operatively connected to each said fuel injection pump, fuel injection nozzles for directly injecting the fuel from said at least one pump into the respective engine cylinders, ignition plugs for igniting and burning the fuel charges injected from said nozzles by spark discharge, and suction air passages through which air is caused to flow toward the combustion chambers of said engine cylinders, throttle valves each mounted within each suction air passage to open or close the same, throttle control mechanisms each connected to each said throttle valve and to said fuel control rack to open or close said valve as a function of the quantity of fuel injected, and throttle control means for maintaining the throttle valve opening larger, when the engine is under load condition, than the throttle valve opening as determined by the fuel control rack when the engine operates under no-load condition.

4,130,101

TRANSISTORIZED IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

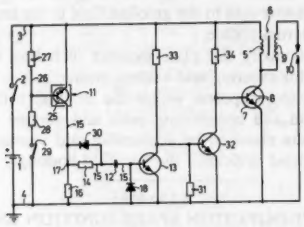
Werner Jundt, Ludwigsburg; Bernd Bodig, Leinfelden; Gerhard Söhner, Remshalden; Walter Ruf, Korntal-Munchingen; Helmut Roth, and Peter Werner, both of Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 21, 1976, Ser. No. 707,323

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533046

Int. Cl.[2] F02P *9/00, 11/00*

U.S. Cl. 123—148 E 11 Claims



1. Transistorized ignition system for an internal combustion engine have an ignition coil (6);

a main switching transistor (7) connected in series with the primary (5) of the ignition coil (6);

an ignition breaker switch (11) connected to and controlling conduction or blocking of the switching transistor (7) in accordance with commanded ignition events;

a control capacitor (12) connected to the switching transistor (7) to control the switching transistor to non-conduction or blocked state if the engine should be stopped, with the ignition breaker switch (11) closed;

a control resistor (16) connected between the positive (3) and negative (4) terminals of a source (1) and in series with said breaker switch (11), the junction (17) between said control resistor (16) and said ignition breaker switch (11) being connected to the control capacitor (12);

a charge discharge resistor (14) forming a series connection (15) with the ignition breaker switch (11) and the control capacitor (12) between the positive (3) and negative (4) terminals of a direct current source (1);

a capacitor discharge circuit (18) connected to the control capacitor;

means connected to the control capacitor (12) and gradually changing over the conduction state of the main transistor (7) from conduction to blocking to prevent induction of a high-voltage pulse in the secondary (9) of the ignition coil (6) after the engine has stopped, comprising

an auxiliary transistor (13) connected to the control capacitor (12) and a control circuit therefor gradually changing the conduction of the emitter-collector path of said auxiliary transistor, the main switching transistor (7) being connected to and controlled by said auxiliary transistor and similarly gradually changing to blocking state in dependence on the gradual change in conduction of the emitter-collector path of the auxiliary transistor (13);

a coupling transistor (32, 38) connected to and controlled by said auxiliary transistor, annd having its emitter-collector path connected in parallel to the base-emitter junction of the main switching transistor (7);

and wherein the collector of the auxiliary transistor (13) is connected to the positive terminal (3) of the source (1) — the emitter is connected to the negative terminal (h) of the source (1);

and the base of the auxiliary transistor (13) is connected to the capacitor discharge circuit the auxiliarly transistor (13) providing a control output through said coupling transistor (32, 38) to the main switching transistor (7).

4,130,102

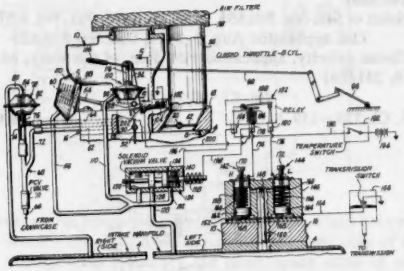
ADAPTOR AND CONTROL SYSTEM ARRANGEMENT FOR CONVERTING MULTIPLE CYLINDER CARBURETOR ENGINES FOR SPLIT OPERATION

Arthur E. Churchill, Alexandria, Va., assignor to George A. Stanford, Marlow Heights, Md., a part interest

Filed Sep. 1, 1977, Ser. No. 829,974

Int. Cl.[2] F02D *13/06*

U.S. Cl. 123—198 F 20 Claims



1. In a motor vehicle including a multiple cylinder internal combustion carburetor engine having an intake manifold for supplying a fuel-air mixture to the engine cylinders, said intake manifold being divided into first and second sections having separate inlet openings, a first set of the engine's cylinders being connected with the first section of said intake manifold and a second set of said cylinders being connected with the second of said sections, a transmission connected with said engine, and an accelerator pedal, an adaptor and control system arrangement for effecting either full or split operation of said engine, comprising:

an adaptor mounted on said intake manifold, and including first and second passages aligned with the inlet openings of said first and said second manifold sections, respectively, and an air port in communication with said second manifold sections;

first valve means mounted in said first passage of said adaptor, and movable between open and closed positions;

second valve means mounted in said air port in said adaptor, and movable between open and closed positions;

means interconnecting said first valve means with said second valve means for effecting substantially simultaneous operation thereof, and arranged so that said second valve means will open when said first valve means is closed, and vice versa;

valve motor means connected to operate said interconnected first and second valve means;

a carburetor mounted on said adaptor and having separate first and second chambers aligned with said first and said second passages, respectively, said carburetor including a throttle shaft, a throttle arm for operating said throttle shaft, and an idle screw engageable by said throttle arm;

linkage means connecting said throttle arm with said accelerator pedal; and

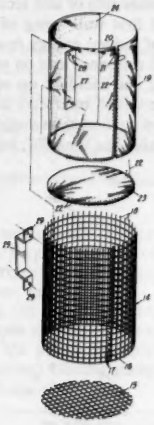
control means with said valve motor means for operating the same in response to the valve of vacuum within said first intake manifold section, and arranged to close said first valve means when the vacuum in said first intake manifold section rises above a first, preselected value, and to open said first valve means when the vacuum in said first intake manifold section falls below a second, preselected value;

said control means including a holding circuit operable to hold said first valve means in its closed position after it has been closed in response to vacuum in said first inlet manifold section exceeding said first preselected value, until after said vacuum value falls below said second preselected value.

4,130,103
CHARCOAL LIGHTER BASKET

Leonard P. Zimmerman, 1443 Spring Hill Ter., Augusta, Ga. 30904

Filed Mar. 11, 1977, Ser. No. 776,491
Int. Cl.[2] F23B 3/00
U.S. Cl. 126—25 B 6 Claims

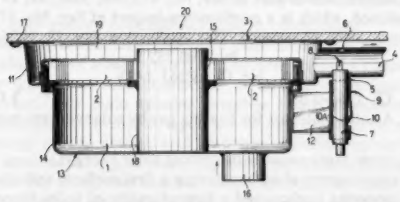


1. A device to facilitate igniting and handling fuel briquettes comprising an outer stiff wire mesh basket body serving as a primary support for briquettes, an interior finer wire mesh liner for the outer basket body adapted to retain small briquette particles within the device during use thereof, said interior wire mesh being of a double thickness, said liner being telescoped into said basket body in the assembled device, a carrying handle for the device on the side wall thereof, and a heat shield panel on the side wall of the device adjacent to the handle to protect the hand of a user of the device, said heat shield panel being positioned within the outer wire mesh and a thickness of the interior wire mesh, said outer basket body and said liner being substantially cylindrical and open at their tops and having superposed bottom walls.

4,130,104
GLOW WIRE IGNITION WITH ON/OFF AND HOT WARNING MEANS FOR GAS HEATED STOVE

Klaus Kristen, Wiesbaden, and Herwig Scheidler, Finthen, both of Germany, assignors to JENAer Glaswerk Schott & Gen., Germany

Filed Sep. 12, 1977, Ser. No. 832,235
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1976, 2641274
Int. Cl.[2] F24C 3/04
U.S. Cl. 126—39 J 16 Claims



1. In a cooking stove assembly of the type having a transparent cooking plate in combination with at least one gas burner assembly, each such burner assembly having

(a) a perforated burner plate which is located in fixed, spaced relationship to the underside of said cooking plate,

(b) a wall means surrounding said burner plate and defining a heating chamber below said cooking plate,

(c) an exhaust gas flue leading from an aperture in said wall means,

(d) pipe means for delivering a combustible gas to said burner plate,

(e) gas lighter means for igniting said gas,

(f) adjustable valve means for controlling the flow of said gas in said pipe means, and

(g) control means for operating each such burner assembly, including an "on-off" switch means for each such burner assembly,

the improvement which comprises for each such burner assembly in combination

(A) said gas lighter means comprises an igniter wire means electrically heatable to a glowing condition with low voltages and amperages,

(B) mounting means for positioning said igniter wire means in said exhaust gas flue means in spaced, adjacent relationship to said heating chamber,

(C) window means defined in said flue means and spatially located so that said igniter wire is visible through said cooking plate whenever said igniter wire is in such a glowing condition,

(D) temperature sensing means for determining the temperature of said cooking plate in the region of said heating chamber and for generating a signal representative of the temperatures so sensed,

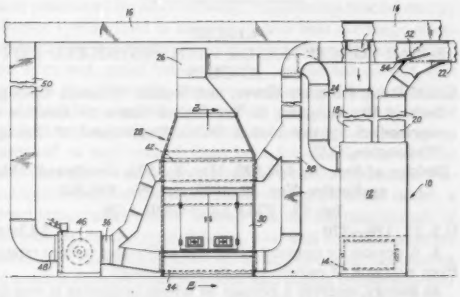
(E) first electrical switch means and associated first electrical means for maintaining said igniter wire means in such a glowing condition whenever said burner assembly is operating, and

(F) second electrical switch means, and second associated electrical means for maintaining said igniter wire in such a glowing condition whenever said cooking plate has a temperature which exceeds a predetermined value as sensed by said temperature sensing means.

4,130,105
AUXILIARY WOOD BURNING FURNACE

Leoda Melton, 134 S. Foster St., Mansfield, Ohio 44903

Filed Jul. 5, 1977, Ser. No. 812,663
Int. Cl.[2] F24B 7/02
U.S. Cl. 126—110 R 5 Claims



1. In combination:

a forced air furnace having a firebox, a hot air outlet connected to a distribution duct, a return duct, and a first blower for receiving air through said return duct and

blowing the same through said hot air outlet to said distribution duct;

a wood burning furnace separate from said forced air furnace, said wood burning furnace having a firebox, a second outlet, a second inlet, and a second blower for blowing air from said second inlet to said second outlet;

first conduit means connecting said second outlet directly to said distribution duct;

second conduit means connecting said return duct directly to said second blower; and

the fireboxes of both said furnaces being provided with exhaust means connected to a common flue.

4,130,106

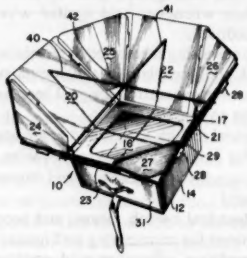
SOLAR STOVE

Merton L. Clevett, and Mildred L. Clevett, both of 4685 S. Ogden St., Englewood, Colo. 80110

Filed Mar. 23, 1977, Ser. No. 780,288

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **3 Claims**



1. A solar stove that is portable and foldable, comprising:

(a) a box-like oven formed from multiple layers of corrugated paperboard for thermal insulation, the paperboard forming the bottom and four lateral side walls of the oven, and a transparent top face allowing radiant solar energy to be directed therein;

(b) four rectangular corrugated paperboard reflector panels, each having a reflective covering thereon, one panel being integrally and hingedly attached to each of the four lateral sides of said oven and extending upwardly therefrom to direct solar energy through said transparent top, and

(c) a cross-shaped member structurally joining opposite reflective panels and providing a sun sight for accurately aiming said transparent face of the oven at the sun.

4,130,107

SOLAR CONCENTRATOR WITH RESTRICTED EXIT ANGLES

Arnulf Rabl, Downers Grove, and Roland Winston, Chicago, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

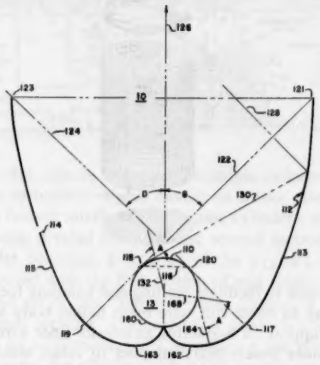
Division of Ser. No. 663,590, Mar. 3, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,340

Int. Cl.[2] F24J *3/02*; G02B *5/08*

U.S. Cl. 126—270 **5 Claims**

1. A device for concentrating and collecting radiant energy from a source of radiant energy, comprising:

an energy receiver a portion of whose perimeter is non-linear and has a cross section bounded by and on a first side of a first reference axis and which is convex with respect to said first reference axis, said cross section of said portion having a second axis extending therethrough perpendicular to said first reference axis, the perimeter of the cross section of said portion extending from a first tangent point along said first reference axis to a second tangent point along said first reference axis such that a first shadow line intersects said second axis on the first side of said first reference axis at an angle B and is tangent to the perimeter of the cross section of said portion at said first tangent point and such that a second shadow line intersects said second reference axis on the first side of said first reference axis at an angle D and is tangent to the perimeter of the cross section of said portion at said second tangent point, a first side wall for directing radiant energy being positioned on the same side of said second axis as said first tangent point, said first wall being of such contour that any extremal ray of radiant energy from the source intersecting said second reference axis on said first side of said first reference axis and incident on said first wall is directed along a line which intersects the perimeter of the cross section of said portion at an angle of value A, where A is a particular value less than 90°, said first wall extending from said first shadow line to no further than an intersection with said second shadow line, and a second side wall wall for directing radiant energy being positioned on the same side of said second reference axis as said second tangent point substantially opposite said first side wall, said second side wall being of such contour that any extremal ray of radiant energy from the source intersecting said second reference axis on said first side of said first reference axis and incident on said second side wall is directed along a line which intersects the perimeter of the cross section said portion at said angle A, said second wall extending from said second shadow line to not further than an intersection with said first shadow line, said energy receiver and said first and second side walls extending along a third reference axes perpendicular to said first and second reference axes to form a trough-like structure.



4,130,108

SOLAR COLLECTOR FOR HEATING A FLUID

Pandit G. Patil, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 672,098, Mar. 31, 1976, abandoned, which is a continuation-in-part of Ser. No. 573,497, May 1, 1975, abandoned. This application Jun. 28, 1976, Ser. No. 700,257

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **3 Claims**

1. A solar collector for heating gas by solar energy, comprising:

a cover plate capable of passing solar energy;

a solar energy absorber having a first surface, and a second opposite surface and a first plurality of holes therein for flowing the gas to be heated away from said first surface and a second plurality of holes for flowing the gas to be heated away from said second surface, said first and second plurality of holes alternated along said absorber;

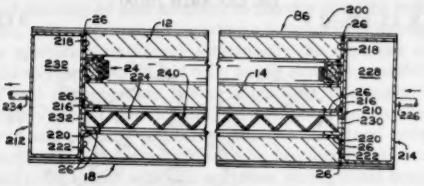
a plate;

means for mounting said cover plate in spaced relation to

said first absorber surface to provide a plurality of first heating compartments and said plate in spaced relation to said second absorber surface to provide a plurality of second heating compartments;

means for preventing uncontrolled movement of ambient air into the said first and second heating compartments;

said first plurality of holes directs the flow of gas to be heated into said first heating compartment away from the



first surface of said absorber toward said cover plate and said second plurality of holes directs the flow of gas to be heated away from the second surface of the absorber toward said plate; and

means for passing the gas to be heated into at least one of said compartments and out of at least one of said compartments wherein the gas to be heated as it passes through said first and second heating compartments is heated by convective heat transfer.

4,130,109

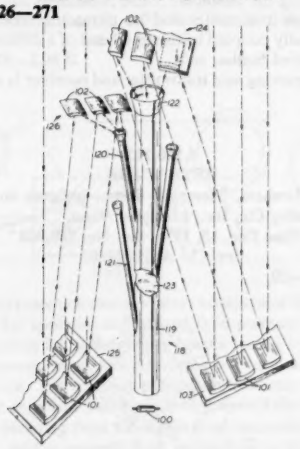
SOLAR ENERGY CONCENTRATOR

Chris M. Brueck, 615 Chestnut, Muscatine, Iowa 52761

Continuation-in-part of Ser. No. 854,850, Nov. 25, 1977, which is a continuation of Ser. No. 573,915, May 2, 1975, abandoned. This application Nov. 25, 1977, Ser. No. 855,014

Int. Cl.[2] F24J *3/02*; G02B *5/14*

U.S. Cl. 126—271 **3 Claims**



1. A solar energy concentrator system comprising:

a reflecting concentrator having a main tubular member and a plurality of smaller tubular branches, an energy pickup device operatively connected to an energy utilization device, said main tubular member being substantially upright and having an open lower end directed to said energy pickup device, said branches extending upwardly at small acute angles from respective points spaced longitudinally along said main tubular member, said branches opening into said main tubular member, said main tubular member and said branches having highly polished reflective inner walls,

a plurality of first reflectors, a plurality of second reflectors, different ones of said second reflectors being associated with different ones of said branches and being at a level higher than respective upper ends of respective ones of said branches, said first reflectors being associated with certain ones of said second reflectors and being positioned at levels below said respective second reflectors, each of said first and second reflectors having a reflecting surface, said first reflectors being rotated and tilted with respect to respective reference axes during a portion of each day to position said reflecting surfaces thereof for reflecting energy from the sun to respective ones of said second reflectors, and said second reflectors being oriented to reflect solar energy from respective ones of said first reflectors into said upper ends of respective ones of said branches.

4,130,110

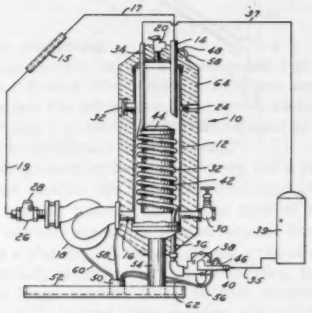
SOLAR HEATING SYSTEM COMPONENT AND CONTROL THEREFOR

Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116

Filed Jun. 20, 1977, Ser. No. 807,646

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **1 Claim**

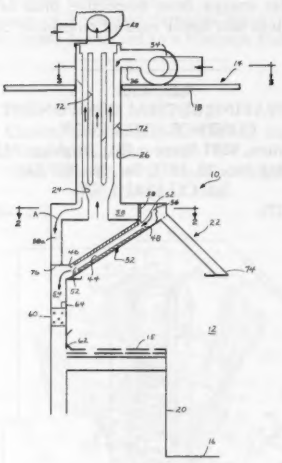


1. In a solar heating system component comprising a closed vessel, a first fluid inlet and a first fluid outlet for said vessel, said first fluid inlet being adapted for connection to the fluid outlet of a solar energy collection system through which fluid flows in a closed system as a heat exchange medium, said first fluid outlet being adapted for connection to the fluid inlet of said solar energy collection system, said vessel defining an expansion tank for said solar energy collection system, a second fluid inlet and a second fluid outlet for said vessel, said second fluid outlet being adapted to forward such heated fluid to a point of use, and a heat exchange structure within the vessel positioned for heat exchange relationship to solar energy collector system fluid in the vessel, said heat exchange structure including means for fluid flow therethrough, said second fluid inlet and outlet being operably connected to said heat exchange structure, the improvement comprising a variable speed electric motor driven first fluid pump connected to said first fluid outlet and a second electric motor driven fluid pump connected to said second fluid inlet for circulation of fluid pump through the respective systems, a first temperature sensor located to sense the temperature at the collector outlet, a second temperature sensor located to sense the temperature of fluid pumped by said second pump, a control device connected to said first and second sensors, means operably connecting said control device to the motors of said pumps to energize said pumps when the differential temperature of fluids being pumped by said pumps reaches a predetermined minimum valve, said control device including means to cause said variable speed electric motor to run at low speed when said differential temperature of said fluids is at said predetermined minimum and to increase the speed thereof when said temperature differential increases, said control device including means to cause said electric motor of said second fluid pump to run at a constant speed.

4,130,111
VENTILATING SYSTEM

Cedomir B. Ristic, 23820 Harper, St. Clair Shores, Mich. 48080

Filed Apr. 21, 1977, Ser. No. 789,612
Int. Cl.[2] F23J *11/00*
U.S. Cl. 126—299 D 1 Claim

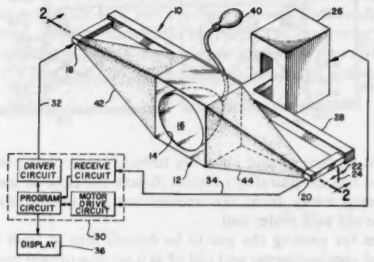


1. A ventilating system comprising:
a vent hood;
exhaust means having an inlet coupled to said hood and including a filter, an exhaust duct and an exhaust blower means for removing heated air from under said hood and through said filter and said exhaust duct to discharge said removed air to the exterior of a building in which said hood may be disposed, said filter having a plurality of air conduits extending therethrough;
intake means including a return duct and an intake blower means for introducing fresh air into said hood separately from said exhaust air, said fresh air being directed through said filter air conduits such that said exhausted, heated air preheats said fresh air;
the side and rear walls of said hood being of a hollow construction for directing the flow of said fresh air;
the inside walls of said hood being exposed to heated air, said inside walls further heating said fresh air;
a plurality of exhaust tubes defining said exhaust means, said exhaust tubes being disposed within said return duct such that the fresh air passing through said return duct is preheated by the exhausted, heated air passing through said exhaust duct;
electrical heating means disposed downstream of said filter air conduits;
temperature sensing means for sensing the temperature of the air passing through said air conduits, said electrical heating means being responsive to said temperature sensing means for heating said preheated air to a predetermined value;
a normally closed passage means for bypassing said filter air conduits; and
a damper in said passage means for selectively opening said passage means to communicate fresh air downstream of said filter air conduits.

4,130,112
COUPLING APPARATUS FOR ULTRASONIC MEDICAL DIAGNOSTIC SYSTEM

Robert E. Frazer, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 15, 1976, Ser. No. 741,749
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 V 8 Claims

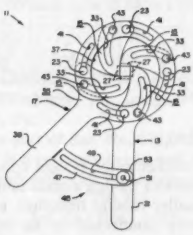


5. An ultrasonic mammography system comprising:
walls forming a substantially hemispheric cavity for receiving a breast to be examined, said walls being of substantially uniform thickness;
a pair of tapered sound-transmitting bodies lying on either side of said walls which form said cavity, with the large ends of said tapered bodies lying nearest said cavity and acoustically coupled thereto, each tapered body having elastic walls forming a tapered chamber and a quantity of fluid filling the chamber;
an ultrasonic transmitter and an ultrasonic receiver, each acoustically coupled to the small end of a different one of said tapered bodies; and
means for moving said transmitter and receiver in a scanning pattern.

4,130,113
RETRACTOR

Charles M. Graham, Memphis, Tenn., assignor to Richards Manufacturing Co., Inc., Memphis, Tenn.

Filed Dec. 15, 1976, Ser. No. 750,968
Int. Cl.[2] A61B *17/02*
U.S. Cl. 128—20 7 Claims



1. A surgical retractor for holding open a surgical incision, said retractor comprising:
(a) body means having an aperture therethrough for placement over the incision;
(b) a plurality of post members fixedly attached to said body means substantially adjacent and spaced substantially equal distance about said aperture through said body means;
(c) a plurality of substantially opposed blade means movably attached to said body means and extending into said aper-

ture through said body means blade means, portions on said for being inserted into and engaging the incision to be held open, each of said plurality of blade means being pivotally mounted to one of said plurality of post members, each of said plurality of blade means including an elongated, slightly curved slot therethrough; and

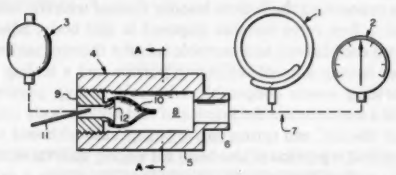
(d) trigger means for causing said plurality of blade means to simultaneously diverge from one another and pivot about said plurality of post members to thereby open the incision, said trigger means including a body member having an aperture therethrough substantially the same size as said aperture through said body means, said body member of said trigger means having a plurality of elongated, slightly curved slots therethrough for slidable engagement with said plurality of post members to allow said body member of said trigger means to be movably attached to said body means with said apertures through said body means and said body member of said trigger means being constantly in substantial alignment with one another, said trigger means including a plurality of cam members fixedly attached to said body member thereof for slidable engagement with said elongated slots of said plurality of blade means so that when said body member of said trigger means is rotated relative to said body means, said plurality of blade means will be simultaneously pivoted about said plurality of post members.

4,130,114

FLUID PRESSURE MEASURING OR TESTING SYSTEM AND BLEED REGULATOR VALVE THEREFOR

Donald H. Peeler, Hendersonville, N.C., assignor to Sybron Corporation, Rochester, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,341
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 G **22 Claims**



1. A sphygmomanometer system comprising fluid-containing means for applying a measured fluid pressure to a cardiovascular system for measuring pressures arising in said cardiovascular system, means for measuring pressures arising in said cardiovascular system, said sphygmomanometer system also including a regulator valve connected to said fluid-containing means for bleeding fluid from said fluid-containing means for decreasing said measured fluid pressure at a predetermined rate;

said regulator valve including a tube having a flexible wall, said tube being open at both ends, and having the opening at one said end formed with a slit having surfaces which sealingly contact each other when the pressure within said tube and the pressure without said tube are substantially the same;

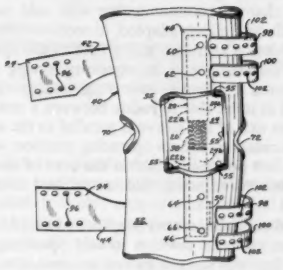
said regulator valve also including a pin means in said tube for separating said surfaces somewhat, said pin means including a pin projecting into said slit, said tube being connected to said fluid-containing means, such as to expose the exterior of said tube to said measured fluid pressure, and its interior to a second fluid pressure lesser than said measured fluid pressure, whereby the said measured fluid pressure maintains said slit closed save for said pin.

4,130,115

BRACE HINGE

Glenn N. Taylor, 231 Thomas, Cary, Ill. 60013

Filed May 2, 1977, Ser. No. 792,824
Int. Cl.² A61F 5/01
U.S. Cl. 128—80 C **13 Claims**



1. A hinge, comprising:

a first hinge member having a housing, and a plurality of elongated flexible ribs extending from one end of said housing, said ribs being spaced laterally across the housing and defining a plurality of laterally spaced grooves extending longitudinally in the housing;

a second hinge member having a housing, and a plurality of elongated flexible ribs extending from one end of the second member housing, the second member ribs being spaced laterally across the second member housing and defining a plurality of laterally spaced grooves extending longitudinally in the second member housing, said ribs of the first hinge member being slidably received in the grooves of the second hinge member, and said ribs of the second hinge member being slidably received in the grooves of the first hinge member; and

means for securing the housing of one hinge member generally parallel a wearer's extremity proximal a wearer's joint, and means for securing the housing of the other hinge member generally parallel the wearer's extremity distal the joint, with said housings being spaced from each other in the region of the joint.

4,130,116

POCKET INHALATOR

Claudio Cavazza, Rome, Italy, assignor to Sigma Tau S.p.A. Industrie Farmaceutiche Riunite, Italy

Filed Jul. 15, 1977, Ser. No. 816,178
Claims priority, application Italy, Aug. 13, 1976, 50904 A/76
Int. Cl.² A61M 15/00
U.S. Cl. 128—203 **4 Claims**

1. An inhalator for spray substances contained in a spray can having a dispensing tube, wherein said inhalator comprises:

(a) a hollow elongated container adapted to contain said spray can in an operating position, said container being formed by a first and a second half, each having lateral walls and only one terminal wall;

(b) companion guide means with sliding engagement means

formed on the sides of said lateral walls of the two halves, adapted to permit a relative limited sliding movement of one of said walls with respect to the other form a first position wherein the container is closed to a second position wherein the container is open and viceversa;

(c) spraying head means supported by a section integral with said first half having a lateral spray nozzle and an longitudinal axial channel communicating with said nozzle said channel including means adapted, to receive with a certain degree of friction said dispensing tube of the spray can;

(d) a sleeved nozzle open at its extremity having a bridged base supported by hinged means on said spraying head means such as to be able to rotate between a rest position, in which the axis of the sleeve is parallel to the axis of the elongated container, and an operating position perpendicular to the rest position, wherein the base of said sleeved nozzle is located adjacent said lateral said lateral spray nozzle; and

(e) mechanical actioning means adapted to bring said sleeved nozzle from said rest position to said operating position when said first and second halves are moved to said second position.

4,130,117

HYPODERMIC SYRINGE

William F. Van Eck, 228 Main St., East Haven, Conn. 06512

Division of Ser. No. 501,448, Aug. 28, 1974, Pat. No. 3,989,045, which is a continuation of Ser. No. 293,489, Sep. 29, 1972, abandoned. This application Sep. 15, 1976, Ser. No. 723,192

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—216 **9 Claims**

1. A hypodermic syringe comprising a prefilled medicament-containing ampul, a hypodermic needle, said ampul having a wall made of a resilient plastic material defining a medicament-containing chamber, with a hollow neck portion leading to a mouth, said needle affixed to said ampul in communication with said mouth, said wall defining an indentation in said neck portion and decreasing the area across said neck portion thereat, a rupturable membrane disposed across said neck portion at said indentation and providing a fluid seal between said mouth and said chamber to maintain a medicament in said chamber in a sterile condition.

4,130,118

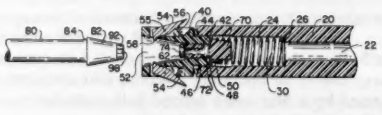
CARTRIDGE DISPENSER FOR MEDICATING DOUCHE

Jack E. McLaughlin, Yuba City, Calif., assignor to Andermac, Inc., Yuba City, Calif.

Filed May 25, 1977, Ser. No. 800,390

Int. Cl.[2] A61M *3/00*

U.S. Cl. 128—229 **15 Claims**



1. In apparatus for making and dispensing an aqueous cleansing, sanitizing, and treating solution for application to body tissue within a body cavity, which apparatus contains a dispensing handle, an applicator nozzle, a cartridge containing water-soluble salts, and at least one normally closed valve, wherein said handle and said nozzle each defines separate portions of a conduit for the passage of water and said portions together define said conduit, the combination comprising: said cartridge disposed in said conduit; and means connecting said cartridge and said valve enabling said valve to open only if said cartridge is in place in said conduit.

4,130,119

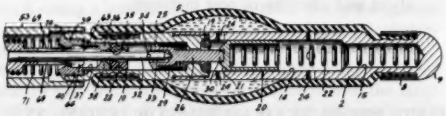
OCCLUSION DEVICE

Robert W. Sessions, Hinsdale; Jerome Jeslis, Chicago, and Richard A. Rodzen, Bolingbrook, all of Ill., assignors to Barlow Mfg. Corp., Hinsdale, Ill.

Filed Apr. 1, 1977, Ser. No. 783,839

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—325 **12 Claims**

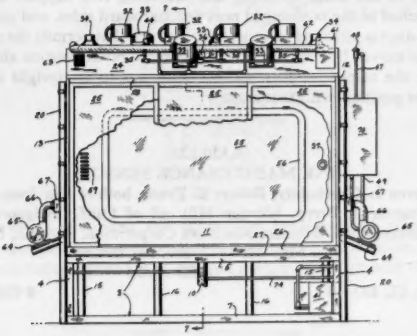


1. A device for effecting occlusion of a blood vessel, in the form of an expandable balloon-type structure, comprising an elongated hollow, rigid body, closed at its distal end and open at its proximal end, a deformable balloon sleeve encircling the intermediate portion of and secured, at its ends, to the body in fluid-tight relation, the body having at least one opening therein connecting the hollow interior thereof with the balloon interior, a first valve member disposed in said body, adjacent the distal end thereof, and movable relative thereto, said valve member having a needle-engaging portion and a sealing portion, sealing means cooperable with said sealing portion to provide a seal between the interior of said hollow body and the exterior thereof, and spring means engageable with said valve member and a portion of the body for urging said valve member into sealing engagement with said sealing means, a second valve member, movable relative to, and disposed in said body between said first valve member and said opening to the balloon interior, said first valve member being movable relative to said second valve member, second sealing means operatively disposed between the inner end of said first valve member and the second valve member, said second valve member having a sealing portion cooperable with said second sealing means to provide a seal between said second valve member and said body, further spring means engageable with said second valve member and a portion of said body for urging said second valve member into sealing engagement with said second sealing means, such valve structures thus being operatively connected in series for cooperably providing connection between the balloon interior and open end of said body, said first valve means being engageable, upon movement thereof in opening direction, with said second valve member to move the latter in opening direction, whereby both valve members may be in open position, means at the open end of said body for guiding a hollow fluid supply needle into said body for engagement with said first valve member to move the latter in opening direction, and means carried by said body for effecting a fluid-tight seal between the open end of said body and such an inserted supply needle.

4,130,120
BATHING CHAMBER

Herbert V. Kohler, Jr., Kohler, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Apr. 11, 1977, Ser. No. 786,067
Int. Cl.[2] A61H *33/06*
U.S. Cl. 128—373 13 Claims



1. In a bathing chamber the combination comprising:
an elongate enclosure having a ceiling, sides and an entry door with a lower sill extending along one lengthwise side;
a decking alongside said lower sill that extends across the length and width of the enclosure to support a user in prone and sitting positions with freedom of movement thereon;
an array of downwardly directed lamps associated with said ceiling and disposed above said decking to radiate downward with substantially uniform coverage of the decking; and
water sprays associated with said ceiling disposed above said decking to substantially uniformly shower the area of the decking.

4,130,121
POLYETHER POLYURETHANE FOAM END WRAP TREATED WITH BUFFER SYSTEM

Thomas A. Wetzel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

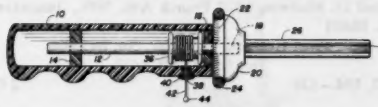
Filed Mar. 31, 1977, Ser. No. 783,118
Int. Cl.[2] A45D *7/00*
U.S. Cl. 132—7 8 Claims

1. An end wrap for use in the permanent hair waving process, comprising:
A. a permeable flexible wafer of open-celled polyether polyurethane foam having:
I. a thickness of from about one-sixteenth inch to about one-sixty-fourth inch,
II. an average pore incidence within the range of from about 30 to 120 pores per linear inch; and
B. a solid, water-soluble buffer system contained in said wafer at a level of at least 50 milligrams of buffer system per cubic inch of foam, said buffer system comprising a mixture of:
I. a water-soluble mono-basic orthophosphate salt, and
II. orthophosphoric acid, wherein the buffer system has a pH of from about 2.5 to about 2.9 and wherein the weight ratio of phosphate moiety of the orthophosphate salt to the phosphate moiety of the orthophosphoric acid ranges from about 3:1 to about 5.4:1.

4,130,122
HAIR CURLER OPERATING DEVICE

David J. Kennedy, R.D. #4, York, Pa. 17404

Filed Mar. 3, 1978, Ser. No. 883,140
Int. Cl.[2] A45D *2/12*
U.S. Cl. 132—34 R 6 Claims

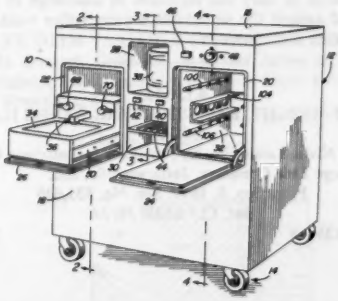


1. A device to support a hair curler unit and rotate it to coil hair upon the curler comprising in combination, an elongated handle, a shaft rotatably supported at one end within bearings within said handle, and the opposite end projecting beyond one end of said handle, means on said opposite end of said shaft removably receiving a hair curler for rotation thereof by said shaft, a spool connected to said shaft adjacent one end of said handle, a flexible cord-like member coilable around said spool and operable to rotate said spool and shaft when said cord-like member is pulled to uncoil it from said spool, and a circular friction member fixed to said shaft and adapted to be rolled upon a surface while manually moving said handle relative to said surface to rotate said spool in a direction to coil said cord-like member upon said spool after the uncoiling of the same therefrom to rotate said shaft in a direction to coil hair upon a curler mounted upon said opposite end of said shaft.

4,130,123
PORTABLE NURSING DEVICE

Roy L. Wines, Jr., and Roy L. Wines, III, both of Southampton, N.Y., assignors to Roy L. Wines & Son, Inc., Southampton, N.Y.

Division of Ser. No. 681,493, Apr. 29, 1976, Pat. No. 4,072,157.
This application Dec. 8, 1977, Ser. No. 858,859
Int. Cl.[2] A47K *1/02*
U.S. Cl. 134—56 R 2 Claims



1. In a portable nursing unit having a plurality of liquid receiving receptacles and a plurality of flexible conduits connected thereto through which liquid is conducted to and from said receptacles, a mobile cabinet enclosing the conduits and said receptacles, closure means mounted on the cabinet for alternately concealing and exposing two of said receptacles enclosed in the cabinet when displaced between closed and open positions, control valve means connected to two of said conduits for selectively supplying liquid to said receptacles, means connecting a third of the conduits to each of the receptacles for draining waste liquid therefrom, means responsive to movement of one of the closure means to the closed position for sealing one of the receptacles internally of the cabinet, and means rendered operative in response to movement of the other of the closure means to open position for supporting the

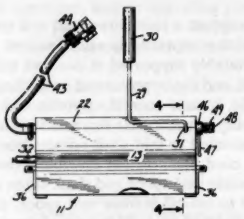
other of the receptacles externally of the cabinet, said other of the receptacles being displaceable between an extended position supported on the other of the closure means and a retracted position stored internally of the cabinet.

4,130,124

PAINT ROLLER CLEANER

Raymond H. Sherwin, 1521 Fourth Ave. NW., Jamestown, N. Dak. 58401

Filed Oct. 13, 1977, Ser. No. 841,664
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—138 **2 Claims**



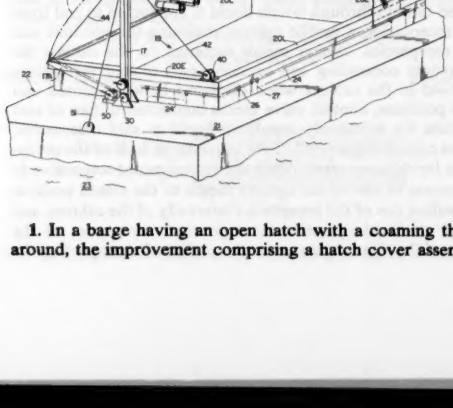
1. A paint roller cleaner comprising:
(a) a housing having side walls and opposite end walls defining an elongated chamber for reception of a paint roller and a portion of a paint roller handle at one end of the paint roller;
(b) a tubular inlet manifold extending along one side of said chamber and mounted in said housing for pivotal movements on its own axis, said tubular manifold having opposite end portions extending through said end walls for connection of one of said end portions to a source of pressurized cleaning liquid;
(c) said side walls defining discharge aperture means generally opposite said manifold;
(d) and a handle fixed to the other one of the end portions of said manifold for imparting pivotal movements to said manifold to vary the direction of discharge of cleaning liquid against the surface of a paint roller rotatably disposed in said chamber.

4,130,125

LIGHT-WEIGHT, EASY-ERECTING BARGE HATCH COVER

James E. Nivin, Louisville, Ky., assignor to American Commercial Barge Line Company, Jeffersonville, Ind.

Filed Sep. 8, 1977, Ser. No. 831,648
Int. Cl.[2] B63B *19/14*
U.S. Cl. 135—6 **7 Claims**



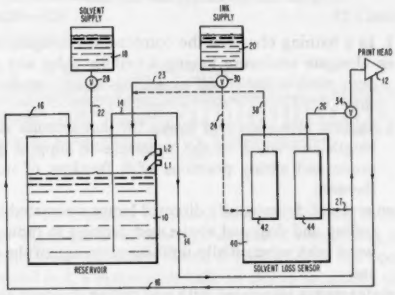
1. In a barge having an open hatch with a coaming thereabout, the improvement comprising a hatch cover assembly provided with two spaced ridge poles positioned to support above the hatch coaming a light-weight weatherproof fabric covering over the hatch in a pup-tent like array wherein the ridge poles are movably supported for stowing in a lowered position, when not in use to support the fabric, the movable support for the ridge poles comprises a pivot assembly positioned on the barge deck amidships at respective fore and aft ends of the hatch coaming and including two support stays attached to the coaming at port and starboard sides, and one of the stays is attached to a tightening winch that permits the pole to be moved by the winch from a lowered pivot position alongside the respective fore and aft coamings to an upright midships position with taut stays.

4,130,126

INK MAINTENANCE SENSOR

Warren L. Chocholaty; Robert K. Evans, both of San Jose, and Francis J. Perry, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1977, Ser. No. 801,689
Int. Cl.[2] G05D *11/06*
U.S. Cl. 137—3 **8 Claims**



6. Method for changing the concentration of a fluid, comprising the steps of:
determining the difference in the rate of fall of heavy floats in reference and working fluid solutions,
adding fluid to the working solution when said difference exceeds a predetermined value.

4,130,127

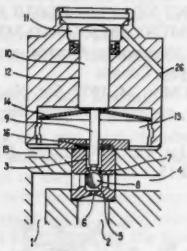
ACCUMULATOR CHANGING VALVE

Ludwig Budecker, Frankfurt am Main, and Anton David, Goetzenhain, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,176
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625555
Int. Cl.[2] G05D *15/00*
U.S. Cl. 137—101 **12 Claims**

1. A valve for connecting a user port with a pressure port or a return port comprising:
a valve chamber connected to said user port, said pressure port, said return port and an accumulator port, said return port and said pressure port opening diametrically opposite each other in said valve chamber and said user port and said accumulator port opening diametrically opposite each other in said valve chamber at right angles to said return port and said pressure port;
each of said return port and said pressure port having an orifice in said valve chamber acting as a valve seat;
a closure member disposed in said valve chamber;
a slidable piston associated with said return port acted upon by pressure in opposition to the force of a spring disposed adjacent said return port, said piston shifting said closure

member from a first into a second valve position, said closure member interrupting the connection between said return port and said user port in said first valve position



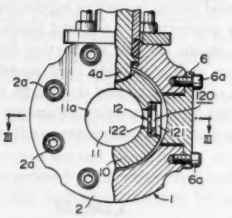
and interrupting the connection between said pressure port and said user port in said second valve position; and a throttle disposed in said return port spaced from said valve seat.

4,130,128

BALL VALVE WITH ORIFICE

Shiro Kaneko, Fujimiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 596,953, Jul. 17, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 760,021
Claims priority, application Japan, Jul. 17, 1974, 49-85275[U]
Int. Cl.[2] F16K *5/10*
U.S. Cl. 137—269 **2 Claims**



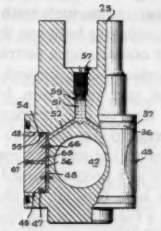
1. A ball valve comprising a valve housing, a fluid flow passage communicated with said valve housing on the opposite sides thereof, a ball having a first through hole for rough control of fluid flow rotatably provided in said valve housing, said ball being rotatable about an axis extending through the center thereof and extending at a right angle with respect to the first through hole and said fluid flow passage, said first through hole being brought into communication with said fluid flow passage by the revolution of the ball, a means for revolving said ball about said axis, a second through hole of smaller diameter than said first through hole extending through said ball at a certain angle with said first through hole in a plane including said through hole and extending perpendicular to said axis of revolution, and an interchangeable orifice for fine control of fluid flow removably mounted in said second through hole whereby rough or fine control of fluid flow is selectively conducted by selectively bringing one of said through holes into communication with said fluid flow passage, said orifice comprising an orifice plate having an orifice opening and an orifice holding member screwed into said fluid passage to hold said orifice plate in the fluid passage, and said valve housing being provided with a removable cover on one side thereof so that the orifice can be interchanged with a different orifice.

4,130,129

PLUG VALVE

Jack H. Pollock, 1428 W. 132nd St., Gardena, Calif. 90249

Filed Nov. 21, 1977, Ser. No. 853,112
Int. Cl.[2] F16K *35/00*
U.S. Cl. 137—385 **9 Claims**



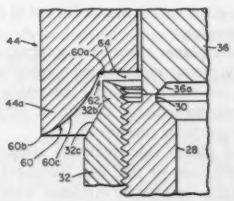
1. A rotary plug valve comprising:
a casing having inlet and outlet ducts therein;
a valve body rotatable in said casing in fluid-tight abutment with said ducts and having a port therethrough conformed to communicate between said ducts;
recesses in said valve body in registry with said ducts;
sealing plugs removeably seated in and sealing said recesses and defining fluid-tight chambers between said plugs and said recesses;
a fluid reservoir within said valve body containing an hydraulic fluid;
fluid passageways communicating between said reservoir and said fluid chambers;
a piston in said valve body operatively connected to said reservoir for applying controlled pressure to the hydraulic fluid in said reservoir; and
drive means in the valve body controllably moving said piston against said hydraulic fluid and thereby urging said sealing plugs into intimate abutment with said inlet and outlet ducts.

4,130,130

VALVE WITH VARIABLE SECONDARY ORIFICE

Robert D. Stewart, Greenville, R.I., and James A. Schretter, Framingham, Mass., assignors to Crosby Valve & Gage Company, Wrentham, Mass.

Filed Nov. 15, 1976, Ser. No. 741,667
Int. Cl.[2] F16K *17/20*
U.S. Cl. 137—475 **7 Claims**



1. In a valve of the type having an annular valve seat fixed in a valve body, the body providing a fluid path through the seat between an inlet and an outlet, and a movable valve head engageable with the seat and movable away from the seat in response to urging of fluid pressure above a predetermined amount of said inlet, the combination with said body of
nozzle means of generally tubular configuration in said fluid path, communicating interiorly with said inlet and having an end portion defining said seat and an annular outer edge portion external to the seat, and

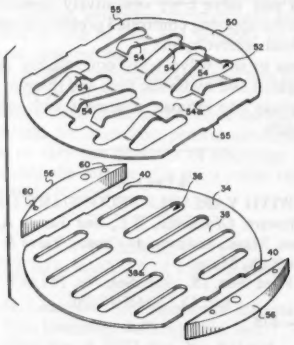
a valve head having an central surface formed to close on the seat, an annular intermediate surface extending radially outwardly from the central surface, and a shroud surface extending radially outwardly from the intermediate surface and having a portion forming with said outer edge portion a variable annular secondary orifice, said surfaces forming with said nozzle means a huddle chamber communicating interiorly with the seat, the secondary orifice communicating between the huddle chamber and the outlet and comprising a restriction in said fluid path, the shroud surface being curved to vary the cross sectional area of said restriction from a minimum valve smaller than that of any restriction within the huddle chamber external to said seat with said central surface in a closed position on the seat to a maximum valve with said central surface at a predetermined maximum spaced position from the seat, the rate of change of said cross sectional area as a function of the spacing between said central surface and the seat increasing from said closed position toward said maximum spaced position, and the cross sectional area of said restriction being smaller than that defined between said central surface and the seat at positions of said central surface above an initial value upon movement from said closed position between said closed and maximum spaced positions.

4,130,131

COMPRESSOR VALVE

Jerzy Kucenty, 49 Edgebrook Cres., Bramalea, Ontario, Canada

Filed Jun. 4, 1976, Ser. No. 693,105
Int. Cl.[2] F16K *15/02*
U.S. Cl. 137—512.1 **5 Claims**



4. A one-piece spring means for use in a plate-type valve and which comprises:

a generally planar spine having terminal end guide surfaces;

generally planar end members integrally formed with said spine, essentially coplanar therewith and extending generally perpendicularly thereto at each end thereof and in both directions therefrom;

generally planar side members integrally formed with respective ones of said end members on opposite sides of said spine, essentially coplanar with said spine, extending generally parallel thereto and having terminal end guide surfaces essentially co-linear with respective ones of said end guide surfaces of said spine;

a plurality of resiliently flexible fingers integrally formed with said spine, extending generally perpendicularly from said spine on both sides thereof toward respective ones of said side members and terminating outwardly of said spine but inwardly of respective ones of said side members; and

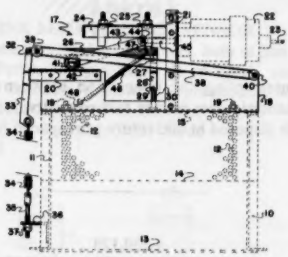
a plurality of resiliently flexible fingers integrally formed with said side members, extending generally perpendicularly therefrom toward said spine and terminating outwardly of said spine, all of said fingers terminating at positions which are offset from the principal plane of said spine.

4,130,132

CONSTANT VOLUME REGULATOR WITH ADJUSTABLE LOAD MEANS

Anthony J. Côté, Shawbridge, Canada, assignor to E. H. Price Limited, Winnipeg, Canada

Filed Mar. 24, 1977, Ser. No. 780,964
Claims priority, application United Kingdom, Aug. 31, 1976, 35980/76
Int. Cl.[2] F16K *15/14, 17/30*
U.S. Cl. 137—512.15 **24 Claims**



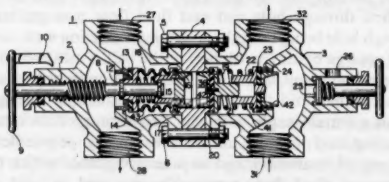
1. A control volume regulator for use with air supply systems which include at least one terminal unit having a volume regulator housing and a flexible curtain control assembly situated in said housing and a source of control air for said regulator; the improvement comprising in combination an actuating rod for said flexible curtain control assembly, operatively connected thereto, means to control the range of movement of said curtain, said means including supporting structure, a lever arm pivotally connected by one end thereof to said actuating rod, fulcrum means on said supporting structure, supporting said lever arm and adjustable load means operatively connected to the other end of said lever arm, said adjustable load means including a tension spring extending between said other end and an anchor point, and means to adjust the tension in said spring.

4,130,133

BYPASS VALVING FLUID CONTROL ARRANGEMENT

Timothy J. Sullivan, Butte, Mont., assignor to The Sullivan Valve & Engineering Company, Butte, Mont.

Filed Nov. 11, 1976, Ser. No. 741,116
Int. Cl.[2] F16K *11/18*
U.S. Cl. 137—599.1 **10 Claims**



1. A bypass valving fluid control arrangement for cooperation with a fluid treatment device by which fluid from a pressure fluid source is treated and made available to its point of use, said arrangement comprising

a body having a plurality of chambers;

a first inlet adapted to be connected to said fluid source and opening into a first of said chambers;

a first valve means within said first chamber controlling the

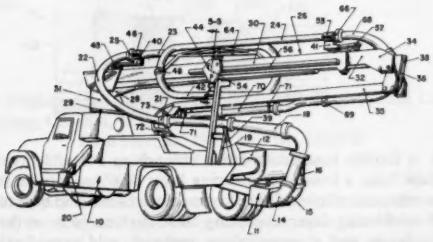
flow of fluid from said first inlet to a first outlet which is adapted to be connected to said fluid treatment device;
a second of said chambers in said housing;
a second valve means for controlling the flow of fluid from said first chamber to said second chamber;
said first and second valve means being mounted on and controlled by a common valve stem;
manual means for controlling the operation of said valve stem;
a third of said chambers in said housing;
a second inlet adapted to be connected to said treatment device and opening into said third chamber;
a second outlet from said third chamber adapted to be connected to said point of use;
third valve means in said third chamber controlling the flow of fluid from said second inlet to said second outlet;
a fourth valve means for controlling the flow of fluid from said second chamber to said third chamber;
said third and fourth valve means being mounted for relative motion therebetween;
first spring means, said first spring means being mounted with respect to both said third and fourth valve means for biasing both said third and fourth valve means to closed position;
both said third and fourth valve means being provided with fluid pressure responsive surfaces either of which responsive to a predetermined pressure is operative to open its respective valve means against the force of said spring means;
whereby when said manual means is actuated to open said first valve means and to close said second valve means fluid pressure is supplied to said treatment device and the resulting pressure in said third chamber opens said third valve means to connect said second inlet to said second outlet and when said manual means is actuated to close said first valve means and to open said second valve means the resulting pressure in said second chamber opens said fourth valve means to bypass said treatment device, the arrangement being further characterized in that
said first and second valve means are slidably mounted on said valve stem, a second spring means being mounted on said valve stem between said first and second valve means and biasing said first and second valve means away from each other and against stops mounted on said valve stem, whereby said first and second valve means are positively actuated in one direction by said valve stem and its respective stop and in the opposite direction by said second spring means.

4,130,134

MATERIAL CONVEYING APPARATUS

Harold J. Castle, Yankton, S. Dak., assignor to Morgen Manufacturing Company, Yankton, S. Dak.

Filed Dec. 13, 1976, Ser. No. 749,798
Int. Cl.[2] B67D *5/64*; F16L *3/00*
U.S. Cl. 137—615 **20 Claims**



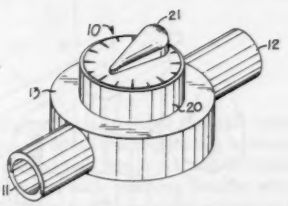
1. Apparatus for conveying materials comprising:
first and second support means spaced from each other and movable linearly with respect to each other along a longitudinal axis extending through said first and second support means;
third support means comprising at least one support member disposed between said first and second support means and movable linearly with respect to said first and second support means along said longitudinal axis; and a material conveying conduit comprising:
a first relatively rigid conduit section connected with and supported by said first support means near one end of said first conduit section,
a second relatively rigid conduit section connected with and supported by said second support means near one end of said second conduit section, and
a third conduit section having one of its ends swivelly connected to the other end of said first conduit section about a swivel axis and the other of its ends swivelly connected to the other end of said second conduit section about a swivel axis, said third conduit section including at least one relatively rigid intermediate conduit member, each of said swivel axes being generally perpendicular to and laterally spaced from said longitudinal axis with adjacent swivel axes being spaced laterally from each other and spaced laterally on opposite sides of said longitudinal axis, and said one intermediate conduit member being supported between its ends by a corresponding one of said support members about an axis generally parallel to said swivel axes.

4,130,135

AUTOMATIC LIQUID FLOW CONTROL DEVICE

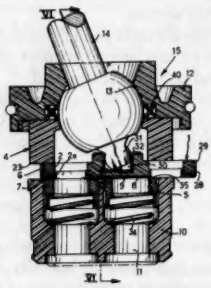
Donald D. Moore, 5716 Benton Ave. S., Minneapolis, Minn. 55436

Filed Jul. 11, 1977, Ser. No. 814,173
Int. Cl.[2] A01G *27/00*
U.S. Cl. 137—624.11 **6 Claims**



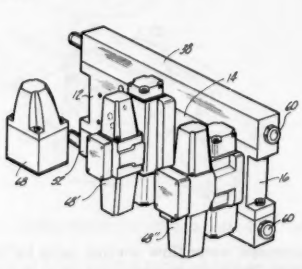
1. An automatic water flow control valve for installation in a water supply line comprising:
(a) housing means including cylindrical wall means, inlet means and outlet means;
(b) paddle wheel means rotatably positioned within said cylindrical wall means, said paddle wheel means having a plurality of generally radially extending paddles, at least two of said paddles contacting the inner surface of said cylindrical wall means in a water-tight fit; said paddle wheel being adapted for rotating in response to a flow of water admitted through said inlet means;
(c) engagement means adapted for engaging said paddle wheel means to prevent said paddle wheel means from rotating thereby preventing water from flowing through said control valve, said engagement means being adapted for disengaging said paddle wheel means to permit rotation of said paddle wheel means thereby permitting water to flow through said control valve; and
(d) timing means adapted to operatively drive said engagement means.

4,130,136
MIXING TAP
Régis Garnier, and Claude Delpla, both of Reims, France, assignors to Societe Generale de Fonderie, Paris, France
Filed Mar. 18, 1977, Ser. No. 779,143
Claims priority, application France, May 4, 1976, 76 13257
Int. Cl.[2] F16K 11/06
U.S. Cl. 137—625.41 11 Claims



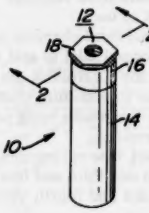
1. A mixing tap comprising a movable obturator provided with two flow orifices and placed between an abutment member and two nozzles for the admission of hot water and cold water over which the obturator is capable of sliding, wherein the obturator is provided with a plastic shoe covered by a metallic shell on which the nozzles are applied in leak-tight manner, that face of said shell on which the nozzles are applied being covered with a coating of self-lubricating polymer.

4,130,137
FLUID DISTRIBUTION SYSTEM
William G. Lane, 34380 Mercer La., Fraser, Mich. 48026
Filed Jul. 20, 1977, Ser. No. 817,157
Int. Cl.[2] F15B 13/08
U.S. Cl. 137—884 8 Claims



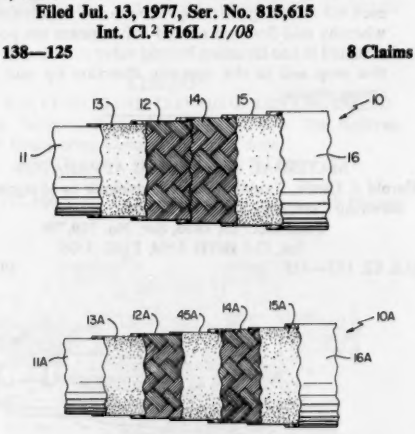
1. A fluid distribution system comprising
at least two fluid distribution plates, each plate having two side surfaces, a top and bottom surface and a front and a back surface,
a fluid inlet port means formed in one side of each distribution plate,
a fluid outlet port means formed in the other side of each distribution plate,
means for mounting fluid control means on each base plate,
means for mounting said fluid distribution plates end to end and adjacent each other,
a first fluid manifold having at least two outlet ports and first means for fastening said first manifold to one side of said distribution plates whereby said first manifold outlet ports fluidly communicate with said fluid inlet port means on said distribution plates, and
a second fluid manifold having at least two inlet ports and second means for fastening said second manifold to the other side of said distribution plates whereby said second manifold inlet ports fluidly communicate with said fluid outlet port means on said distribution plates.

4,130,138
MOLDED STAND-OFF
Kenneth A. Swanstrom, Buckingham Township, Bucks County, Pa., assignor to Penn Engineering & Manufacturing Corp., Danboro, Pa.
Filed May 31, 1977, Ser. No. 802,116
Int. Cl.[2] F16B 09/00, 37/04
U.S. Cl. 138—109 4 Claims



1. A stand-off comprising
a base defining a head and a cylindrical post between which is an undercut groove formed on said post, said head overhanging said post, said undercut groove receiving material displaced by said head from a sheet in which said head is to be embedded, said post having an end portion opposite said head of a smaller outer diameter than the remainder of said post, a tube bonded to said end portion of smaller diameter and of a material which is softer than the material of said base and which has a substantially lower melting point than the material of said base.

4,130,139
FLEXIBLE HOSE CONSTRUCTION AND METHOD OF MAKING SAME
Doyle V. Haren, Clyde, N.C., assignor to Dayco Corporation, Dayton, Ohio
Filed Jul. 13, 1977, Ser. No. 815,615
Int. Cl.[2] F16L 11/08
U.S. Cl. 138—125 8 Claims



1. A flexible hose construction comprising a flexible nylon-11 base tube, a braided reinforcing layer disposed around said base tube, and a layer of adhesive means between said base tube and reinforcing layer consisting of a mixture of a urethane prepolymer and a cross-linking material, said cross-linking material comprising 4, 4' methylene-bis-chloroaniline, said layer of adhesive means being a solely ambient air cured adhesive means and comprising the sole means bonding said braided

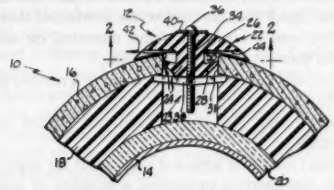
reinforcing layer and said base tube yet providing a tenacious bond therebetween.

4,130,140

HEAT INSULATED CONDUIT ESPECIALLY SUITABLE FOR CARRYING HIGH TEMPERATURE FLUIDS

Ronald N. Cerny, Littleton; Walter B. Peters, Englewood; Thomas H. Sadler, Morrison; Peter Rodrigo, and George M. Mollick, both of Littleton, all of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 8, 1976, Ser. No. 730,775
Int. Cl.² F16L *9/14*
U.S. Cl. 138—149 **6 Claims**



1. In a conduit for carrying high temperature fluid under pressure which conduit includes an outer casing, a concentric inner core and a concentric layer of insulation material therebetween, the improvement comprising means for passing moisture, said moisture being within said layer of insulation material and under a predetermined amount of pressure, to the ambient surroundings of said conduit, along a predetermined path directly through said outer casing, said means also preventing fluid in said ambient surroundings from passing into said layer of insulation material along said path, wherein said means includes a body member constructed of a resilient material and located within said outer casing, said body member includes a circumferential fin integral with and extending out from said body member filling said path through said outer casing, said fin movable between a biased first position for maintaining said path closed in the absence of said moisture under pressure in said layer of insulation material and a second position for opening said path to the passage of said fluid in the presence of said moisture under.

4,130,141

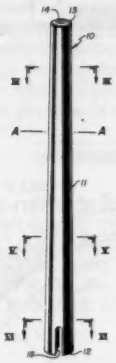
PICKER STICK

F. William Alley, Elmore, Vt., assignor to Page Belting Company, Concord, N.H.

Filed Nov. 23, 1977, Ser. No. 854,475
Int. Cl.² D03D *49/38*
U.S. Cl. 139—157 **7 Claims**

1. A picker stick for use in a fly shuttle loom, comprising:

(a) an elongated main body adapted to swing in the vertical plane of the shuttle motion, the main body having an outside surface which tapers from a larger lower end to a smaller upper end, a bore extending through a substantial portion of the length of the main body is ovate in cross section with the major axis extending in the direction of said plane of the shuttle motion, and



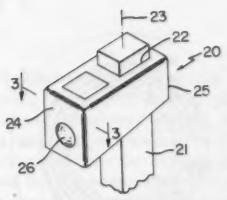
(b) a body of sound and vibration-absorbing material lying in the bore.

4,130,142

LOOP PICKER

Mayo B. Tell, Asheville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Dec. 9, 1977, Ser. No. 858,920
Int. Cl.² D03D *49/36*
U.S. Cl. 139—159 **19 Claims**



1. In a loop picker having at least one face block and a plurality of laminated fabric layers including laminated fabric layers disposed around said face block and laminated fabric layers defining a picker stick receiving passage which has a central longitudinal axis, the improvement wherein at least one of said face block and plurality of laminated layers is comprised of triaxial fabric, said triaxial fabric being defined by three angularly displaced sets of parallel courses of yarn interwoven to prevent slippage of at least one yarn course set along any other yarn course set.

4,130,143

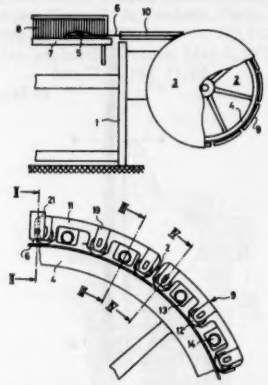
BAND GUIDE ROLLER FOR BAND-GRIPPER LOOMS

Viktor Smutny, Wetzikon, Switzerland, assignor to Ruti Machinery Works Ltd, Ruti, Switzerland

Filed Sep. 16, 1977, Ser. No. 833,829
Claims priority, application Switzerland, Oct. 1, 1976, 12365/76
Int. Cl.² D03D *47/00*
U.S. Cl. 139—449 **9 Claims**

1. A band-gripper loom having a band wheel for the driving of an insertion band in an oscillating manner and having band guide rollers supported on a housing surrounding the band wheel, said guide rollers preventing the insertion band from lifting off from the band wheel, said improvement providing

band guide rollers having ball bearings mounted on said housing, each ball bearing having an inner and an outer race and



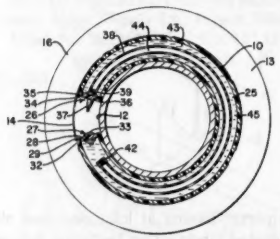
each band guide roller operatively supported on the inner race of said ball bearing.

4,130,144

APPARATUS AND METHOD FOR DISPENSING FLUID WITHIN A TIRE

James T. Harris, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 12, 1976, Ser. No. 731,217
Int. Cl.[2] B60C *17/00*; B65B *3/04*
U.S. Cl. 141—9 **19 Claims**



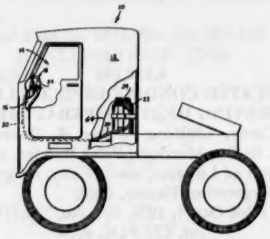
16. A method of dispensing liquid fluid from a container mounted on a rim of a tire rim assembly into a tire cavity enclosed by the tire and rim, said container having a divided chamber, a pressure-transmitting means in said chamber, first one-way valve means for releasing a liquid fluid medium from said chamber and second one-way valve means for automatically communicating a gaseous fluid medium from said tire cavity into said chamber when the pressure in said tire cavity is greater than the pressure in said chamber by a first predetermined amount comprising placing a quantity of liquid fluid medium in a first section of said divided chamber, increasing the pressure of said gaseous fluid medium in said tire cavity by inflation causing injection of said gaseous fluid medium into a second section of said divided chamber at a first predetermined pressure, retaining said gaseous fluid medium in said chamber by said second one-way valve means when the differential beween the pressure of said gaseous fluid medium inside and outside said container is under a second predetermined amount and releasing said liquid fluid medium into said tire cavity from said container through said first one-way valve means when said pressure differential is greater than said second predetermined amount whereby said liquid fluid mediu~ is released into said tire cavity when the pressure in said :e cavity is reduced below a certain level.

4,130,145

LIQUID DISPENSER FOR VEHICLE AND THE LIKE

Paul E. Thomas, Jr., 3421 Louise St., Hapeville, Ga. 30334

Filed Oct. 19, 1977, Ser. No. 843,526
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—88 **10 Claims**



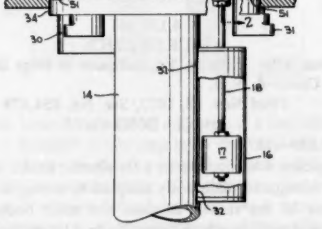
1. In a dispensing device for vehicles:
an insulated container mounted on said vehicle and having a supply of liquid such as cool water contained therein,
a small electrically operated pump mounted on said container for pumping liquid therefrom,
a liquid conduit leading from said pump to a remote point on said vehicle,
a dispensing outlet mounted within the vehicle operator compartment,
a cup support mounted adjacent said outlet for supporting a drinking cup thereon to receive a quantity of liquid dispensed from said outlet,
pump actuation means on said cup support for actuation to operate said pump,
and switch means operated by said pump actuator means for electrically connecting said switch means to said pump on said container whereby liquid is dispensed into said cup.

4,130,146

VISUAL LEVEL INDICATOR

Ronald A. Dunster, 36 S. Whittier St., Carteret, N.J. 07008, and John A. Savage, 1111 Crandon Blvd., Key Biscayne, Fla. 33149

Filed May 23, 1977, Ser. No. 799,609
Int. Cl.[2] B65B *3/26*
U.S. Cl. 141—96 **4 Claims**



1. A coupling apparatus for use in a system for transferring liquids from a storage tank to the tank of a vehicle wherein the

tank of the vehicle has an upwardly facing horizontal manhole means, comprising:

(a) a plate;

(b) said plate having a downwardly extending annular flange having a diameter whereby said flange may fit into said manhole with a relatively snug fit;

(c) said plate having at the underside thereof an annular gasket and external of said flange whereby said gasket at the otherside thereof is in confronting relationship with an edge portion of said manhole means when the apparatus is in place;

(d) manually operated means on the upper side of said plate and extending therethrough and terminating in means for compressively locking said plate and said manhole together in a fluid tight manner;

(e) electrical sensors positioned in said annular gasket to sense that said coupling apparatus has been positioned in a fluid tight means and to prevent liquid flow if said coupling apparatus is not fluid tight;

(f) a drop tube having one end terminating above said plate adapted and constructed to be connected to a source of liquid, the distal end extending through said plate and terminating thereinunder;

(g) visual level indicator means attached to the upperside of said plate;

(h) said indicator means including a rod fluidly tightly extending through said plate and terminating with a float adapted and constructed to float on said liquid in said tank of the vehicle when said tank is almost filled;

(i) a shroud attached to said drop tube adapted and constructed to protect said float while permitting access of said liquid to said float;

wherein said visual level indicator means includes said rod having a visible top portion and a tubular sight tube which terminates in a housing having mounted thereon a normally open electric switch means adapted and constructed to be closed by the top portion of said rod when said rod is driven upwardly when the liquid level in the tank in the vehicle is to a desired level thereby preventing further delivery of said liquid.

4,130,147

FUNNEL WITH SPOUT EXTENSION SUPPORT

Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026

Filed Aug. 19, 1977, Ser. No. 825,918
Int. Cl.[2] B65B *39/00*
U.S. Cl. 141—98 **7 Claims**

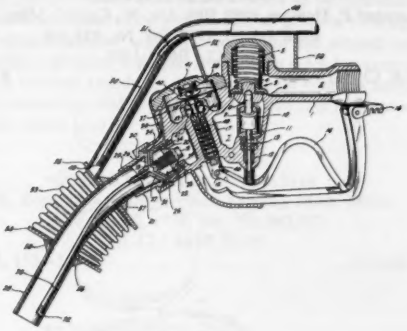
1. In a plastic funnel including a body having a smaller end forming an outlet and further including a spout extension detachably engageable within the smaller end of said body, said spout extension having a coupling end and an angled tubular section forming a circular discharge end remote from said coupling end, a support for the spout extension comprising a ring integral with said body and projecting therefrom, said ring having an opening therein for receiving said discharge end of said spout extension and said discharge end of said spout extension being substantially the same size as said ring opening, and a plurality of angularly spaced fingers on said ring engageable with angularly spaced portions on said discharge end of said extension.

4,130,148

AUTOMATIC SHUT-OFF LIQUID DISPENSING NOZZLE

James L. Keller, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 1, 1976, Ser. No. 701,575
Int. Cl.[2] B65B *3/18, 31/06*
U.S. Cl. 141—218 **7 Claims**



1. A liquid dispensing nozzle comprising:

(a) a body having an inlet port, a discharge port, and a liquid communication passageway housed within said body connecting said inlet port and said discharge port;

(b) a valve within said body for controlling the flow of liquid through said liquid communication passageway;

(c) operating means for opening and closing said valve;

(d) a venturi, situated within said liquid communication passageway, said venturi having a throat opening thereinto for the aspiration of gases into a liquid passing through said liquid communication passageway;

(e) vapor transporting means comprising:

(1) means, mounted on said body, for collecting vapors displaced from a receiving vessel during the filling thereof with liquid passing through said discharge port; and

(2) a vapor removal line connected at one end in vapor-tight engagement with said vapor collecting means and adapted at the other end to be connected to means for removing vapors transported through said vapor removal line;

(f) a gas communication passageway connecting said venturi throat opening with a first and second orifice through which gases are drawn into said gas communication passageway when liquid is passing through said discharge port, said first orifice being disposed adjacent to said discharge port so that gases in said gas communication passageway are in communication with fluids surrounding said discharge port, and said second orifice being disposed in said vapor removal line such that said gas communication passageway is in fluid communication with said vapor transporting means, said second orifice being disposed in said vapor removal line and connected to said gas communication passageway by (1) a rigid tube terminating in said second orifice and (2) means, in fluid communication with

said tube and the remainder of said gas communication passageway, for flexibly mounting said tube within said vapor removal line such that that end of said tube containing said second orifice is free to fall by gravity to a position within said vapor removal line such that a liquid passing through said vapor removal line must flood said second orifice; and

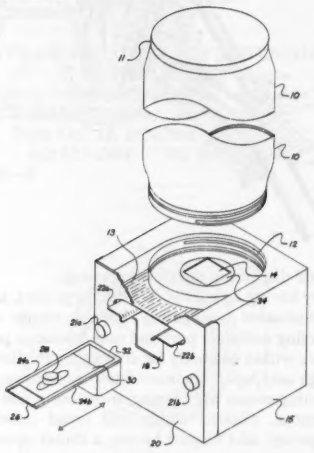
(g) means for activating said operating means to close said valve when either of said orifices is filled with liquid, said activating means comprising (1) a chamber, housed within said body of said nozzle, which chamber is divided by a pressure responsive diaphragm into a first and second chamber, said first chamber being a portion of said gas communication passageway, and (2) means, attached to said diaphragm, for closing said valve in response to the flexing of said diaphragm into said first chamber when a reduced pressure, caused by the suction produced by said venturi when liquid passes therethrough and either of said orifices is filled with liquid, is present in said first chamber.

4,130,149

COFFEE DISPENSER

Leonard P. Hausam, 6801 50th Ave. N., Crystal, Minn. 55428

Filed Jul. 25, 1977, Ser. No. 818,568
Int. Cl.[2] B65B 1/06
U.S. Cl. 141—358 **8 Claims**



1. A dispenser for dispensing a measured volume of granular material, the dispenser comprising:

a supply container for containing the granular material;

a plate fixed at the bottom of the supply container and having a dispensing opening;

a pair of horizontally disposed slide rails fixed to a bottom surface of the plate on opposite sides of the dispensing opening, the slide rails and the bottom surface of the plate together defining a horizontally disposed slide track underlying the supply container, the slide rails extending in front of a front edge of the plate to form a guiding path into the slide track;

slide closure means mounted in the slide track and positioned to slide along the bottom surface of the plate in surface to surface contact therewith;

spring means for normally holding the slide closure means in closed position underlying the dispensing opening;

a separate measuring cup member for insertion into and movement along the slide track, the measuring cup member having a handle on the outer end thereof, a pair of laterally extending flange elements on the sides thereof adapted to be received in the slide track and to position the top edges of the measuring cup member in sliding coplanar engagement with the bottom surface of the plate when the measuring cup member is inserted into the slide track, and a bumper element on the inner end thereof for engaging the slide closure means and moving the slide closure means to an open position when the measuring cup member is inserted into and moved along the slide track;

a base for receiving and holding the supply container at the bottom thereof, the base having an opening through which a granular material may pass, wherein the plate is fixed at the bottom of the base and the dispensing opening corresponds at least in part to the opening in the base;

a housing for containing the base, the plate, the slide rails, the slide closure means, and the spring means;

a removable front panel connected to the housing and having an opening therein through which the measuring cup member may be inserted, the removable front panel being connected to the plate and the slide rails whereby the base, the plate, the slide rails, the slide closure means, and the spring means are removed from within the housing when the front panel is removed from the housing; and

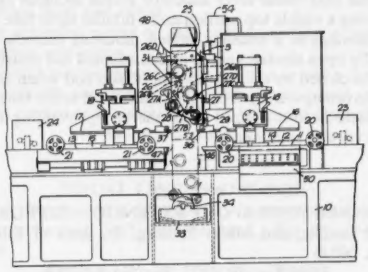
stop means for positively defining the open position of the slide closure means to position the measuring cup member under the dispensing opening to receive granular material from the supply container.

4,130,150

FINGER JOINTING MACHINE

Alan J. Cook, Bovingdon; Norman Brooks, Tring, and Anthony D. Kirkby, Dunstable, all of England, assignors to Cook Bolinders Limited, Leighton Buzzard, England

Filed Dec. 3, 1976, Ser. No. 747,365
Int. Cl.[2] B27F 1/16
U.S. Cl. 144—2 R **7 Claims**



1. A finger jointing machine comprising, in combination:

(a) a horizontal support table;

(b) a vertical guide fence adjacent said support table;

(c) means for moving timber along said support table;

(d) means for clamping two pieces of timber on said support table and against said guide fence, with the rear end of one piece of timber spaced from the front end of the other piece of timber;

(e) a cutting and gluing unit movable vertically through the space between the ends of the timber clamped by said clamping means, said cutting and gluing unit including:

(i) two rotatable cutters rotatable about horizontal axes, each cutter having axially spaced teeth, the teeth of one cutter being axially spaced from those of the other by half the spacing between the teeth of each cutter;

(ii) means to rotate the cutters in opposite directions, whereby the teeth of one cutter engaging the rear end of said one piece of timber and the teeth of the other cutter engage the front end of said other piece of timber are both moving upwardly; and

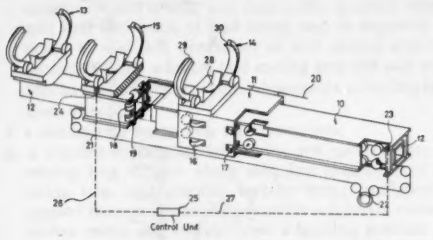
(iii) two ribbed gluing rollers arranged one below each of said cutters, the ribs of said gluing rollers being disposed directly below the teeth of the cutter thereabove; and

(f) means to move said cutting and gluing unit vertically upwardly past the rear end of said one piece of timber and the forward end of said other piece of timber, whereby when said pieces of timber are clamped by said clamping means, said unit cuts and glues interfitting fingers therein.

4,130,151
LOG FEEDING AND DE-BRANCHING MECHANISM

Sven O. Ericsson, P.O. Box 2131, S-710 10 Fjugesta, Sweden

Filed Jun. 10, 1977, Ser. No. 805,428
Claims priority, application Sweden, Jun. 10, 1976, 7606562
Int. Cl.[2] B27C *9/00*; A01G *23/08*
U.S. Cl. 144—309 AC 9 Claims

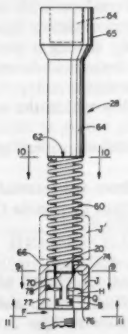


1. A method for debranching a felled tree and simultaneously feeding it axially as a log, comprising:
(a) tightly gripping the tree with a high gripping force by means of a first set of debranching tools which extend around the tree;
(b) loosely gripping the tree with a low gripping force by means of a second set of debranching tools which extend around the tree;
(c) thereafter shifting said first set of tools to effect initial axial feeding while shifting said second set of tools in an opposite direction along a portion of the length of the log to effect initial debranching;
(d) lowering said high gripping force to a low gripping force, and increasing said first-named low gripping force to a high gripping force; and
(e) thereafter shifting said first and second sets of tools in directions opposite to those in which they were first shifted to respectively effect (1) further debranching by said first set of tools along a further portion of the length of the log, (2) and further axial feeding by said second set of tools.

4,130,152
SLOT-HEAD FASTENER AND DRIVER THEREFOR

Ralph A. Bolen, London, Ohio, assignor to John Sawyer, Cincinnati, Ohio, a part interest

Filed Oct. 19, 1977, Ser. No. 843,727
Int. Cl.[2] B25B *15/00*
U.S. Cl. 145—50 D 19 Claims

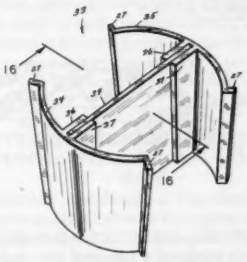


1. A slot head fastener and driver therefor comprising:
a slot head fastener having a threaded shank and a head, said head being polygonal in shape to have a plurality of flats and having a slot defined therein which is in the shape of an inverted T, said slot having a first section defined to extend transversely of said head and a throat section intersecting said first section, said throat section being defined by a pair of laterally spaced parallel side walls which are spaced apart to define a bit receiving gap therebetween, said slot and said throat having tapered portions to facilitate entrance and exit of a bit into said slot; and
a driver for engaging said slot head fastener, said driver including a torquing member having a projecting driver member thereon, a handgrip member having an internal socket defined therein at one end thereof, said handgrip member being sized to be gripped by a user's hand with the user's other hand gripping said torquing member, said internal socket being shaped to receive said torquing member projecting driver member, a shank connected at one end thereof on another end of said handgrip member, a socket member mounted on said shank to be axially movable thereon and having a shape corresponding to the shape of said slot head fastener polygonal head to engage said flats to impart turning torque to said fastener, a spring mounted on said shank to yieldably bias said socket member toward another end of said shank, a bit on said shank another end, said bit including a rectangular portion sized to be received in said slot head fastener gap, and a projecting portion which is located and sized to be received in said head fastener first section, said bit portions forming a T-shaped member which is received in said slotted head fastener inverted T-shaped slot to form a driving connection between said driver and said fastener whereby torque developed by said driver is imparted to said fastener via said socket member and said bit.

4,130,153
GOLF BAG CLUB SEPARATOR

David E. Zopf, 2216 Marilyn Plaza, Lansing, Mich. 48910

Filed Mar. 2, 1978, Ser. No. 882,577
Int. Cl.[2] A63B *55/00*
U.S. Cl. 150—1.5 R 3 Claims



1. In a golf bag club separator, the combination comprising:
a pair of opposed spaced-apart arcuately curved vertically oriented end panels, each of said end panels having a pair of spaced-apart flanges extending radially inwardly from the concave surface thereof so as to define a divider panel engaging channel therebetween; and
a divider wall panel in selective engagement with each of said channels provided on said end panels.

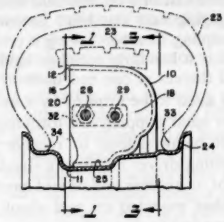
4,130,154
CURVED REINFORCED SUPPORT MEMBER

William J. Hampshire, Peninsula, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 611,979, Sep. 10, 1975, abandoned. This application Jun. 3, 1977, Ser. No. 803,358
Int. Cl.[2] B60C *5/00*
U.S. Cl. 152—158 19 Claims

1. A fiber reinforced body of plastic material in which said body is curved about an axis of revolution and has a generally U-shaped cross section with an inner peripheral edge portion and an outer peripheral edge portion comprising a plurality of relatively long fibers of reinforcing material extending into said body from said edge portions generally in planes containing the axis of revolution of said body and a plurality of rela-

tively short fibers of reinforcing material extending generally circumferentially of said body and in planes perpendicular to



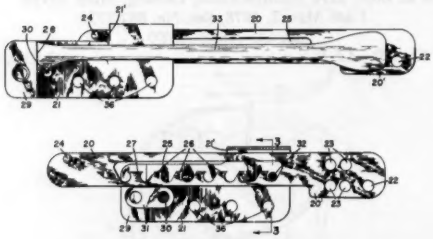
the axis of revolution of said body and the majority of said relatively short fibers being in said edge portions.

4,130,155

SELF TIGHTENING CONNECTOR FOR NON-SKID TIRE CHAINS

Forest H. Barnett, 2602 N. Baltimore, Tacoma, Wash. 98407, and Clarence E. Barnett, 5208 - 156th NE., Redmond, Wash. 98052

Filed Apr. 15, 1977, Ser. No. 787,781
Int. Cl.[2] B60C *27/10*
U.S. Cl. 152—217 **8 Claims**



1. In a self-tightening connector for fastening together the two ends of a side chain of a non-skid tire chain assembly, a bar-shaped part of substantial length; a U-shaped part fitting over the bar-shaped part capable of limited transverse movement on the bar-shaped part and movable longitudinally relative to the bar-shaped part between an extended and a retracted position; ratchet means comprising teeth carried by the bar-shaped part and a pin carried by the U-shaped part; elastic tension means interconnecting said two parts, yieldingly urging said two parts toward the retracted position, and when the connector is attached to a tire chain and mounted on a tire, cooperating with ratchet means in locking said two parts against relative longitudinal movement toward their extended position, said ratchet means being releasable by relative transverse movement of said two frame parts.

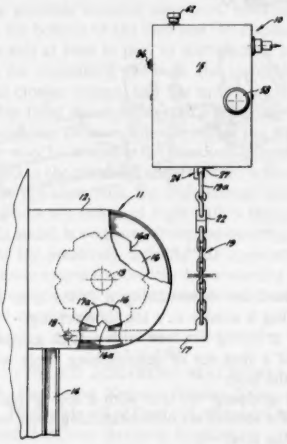
4,130,156

TIME DELAY FIRE CLOSURE RELEASING DEVICE

Russell Wardlaw, San Rafael, Calif., assignor to The Cookson Company, San Francisco, Calif.

Filed Mar. 27, 1978, Ser. No. 890,534
Int. Cl.[2] E05F *15/20*
U.S. Cl. 160—9 **11 Claims**

1. A delayed release mechanism responsive to power interruption for disengaging a tension member after a predetermined period of power outage comprising retaining means supported to move between advanced and retracted positions to capture and release a portion of the tension means, a locking dog member disposed to move between retracted and released positions to lock and unlock the first named means against movement releasing the tension member, means yieldingly urging said dog member toward its said released positions to



release said portion of the tension member, electric means serving when energized, to hold said dog member in its said retracted position against the urging of the last named means, and means for delaying movement of said locking dog member toward its released position to delay release of the tension member.

4,130,157

SILICON NITRIDE (Si_3N_4) LEACHABLE CERAMIC CORES

Donald G. Miller, Bethel Park, and Frederick F. Lange, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 19, 1976, Ser. No. 706,334
Int. Cl.[2] B22D *29/00*; B22C *1/00*
U.S. Cl. 164—132 **7 Claims**

1. A method of producing shaped articles from nickel or cobalt base superalloys having at least one internal passage therein, the method comprising the steps of:

(a) providing a core to conform with the shape of the internal passage, said core consisting substantially of sintered silicon nitride (Si_3N_4) having a density between about 60% and 99%+ of theoretical density of Si_3N_4;
(b) securing the core within a mold;
(c) casting the superalloy within the mold and around the core;
(d) removing the solidified, superalloy casting from the mold; and
(e) leaching the core from the internal passage of the cast article in molten sodium hydroxide (NaOH).

4,130,158

CENTRIFUGAL CASTING MACHINE

Frank M. Kulig, Bloomfield, Conn., and Frank H. Nealon, Plantation, Fla., assignors to The J. M. Ney Company, Bloomfield, Conn.

Filed Oct. 17, 1977, Ser. No. 843,066
Int. Cl.[2] B22D *13/06*
U.S. Cl. 164—289 **17 Claims**

1. A centrifugal casting machine comprising:

a. a base;
b. a casting arm mounted for rotation relative to said base;
c. drive means to rotate said casting arm about an axis of

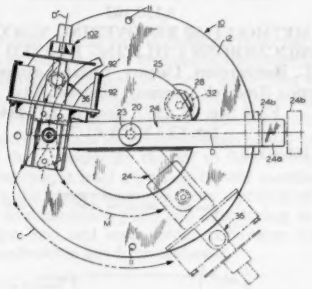
rotation, said casting arm having a first dimension perpendicular to said axis of rotation;

d. a swing arm having a first dimension;

e. pivot means pivotally mounting said swing arm on said casting arm for pivoting about an axis spaced from said axis of rotation of said casting arm, said pivot means permitting pivoting of said swing arm by forces generated by rotation of said casting arm from a first position wherein said first dimension of said swing arm is angularly disposed to said first dimension of said casting arm, to a second position wherein said casting arm and said swing arm have their respective first dimensions extending in the same direction;

f. a casting ring support on said swing arm;

g. a crucible support on said swing arm spaced from said casting ring support along said first dimension of said swing arm, said crucible support being configured to support thereon a refractory crucible adapted to contain a molten metal and tiltable from a holding position to a pouring position by forces generated by initial rotation of



said casting arm, said casting ring support and crucible support being oriented along said first dimension of said swing arm: (i) in said first position thereof, to locate a casting ring and a crucible supported thereon in cooperative alignment to define a flow path therebetween along a line lying in a plane which is approximately tangential to a circle concentric with said axis of rotation of said casting arm, with said crucible support leading said casting ring support in the path of travel of said swing arm and, (ii) in said second position thereof, to locate said casting ring support radially outwardly of said crucible support relative to said casting arm axis of rotation; and

h. guide means operatively engaged with said swing arm to maintain said swing arm in said first position relative to said casting arm for a limited path of movement of said casting arm about its axis of rotation, said guide means being operative to release said swing arm after said limited path of movement to permit pivoting thereof to said second position by forces generated by rotation of said casting arm.

4,130,159

HEAT EXCHANGER

Kazuhiro Ohta, Nagoya, and Mituzi Ohshima, Ohbu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 27, 1975, Ser. No. 580,757

Claims priority, application Japan, May 28, 1974, 49/60970[U]

Int. Cl.[2] F28F *9/00*

U.S. Cl. 165—111 **6 Claims**

1. A heat exchanger used in an automotive vehicle comprising:

upper and lower tanks,

a plurality of conduits extending between and in communication with said upper and lower tanks, and

a plurality of radiating fins provided in spaces between said conduits; wherein said upper tank comprises:

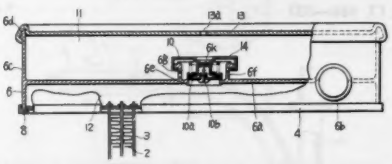
a partition wall, disposed in said upper tank, for dividing said upper tank into upper and lower rooms,

means for maintaining the pressure in said upper room at the pressure of the atmosphere surrounding said heat exchanger,

tubular means, connected to said lower room to communicate said lower room with said atmosphere, for supplying cooling fluid into said lower room therethrough,

a cap removably mounted on the upper end of said tubular means,

a negative pressure valve, positioned on said partition wall apart from said tubular means, for passing air contained in



said supplied cooling fluid therethrough into said upper room as the level of said cooling fluid goes up in said lower room,

means, provided in said tubular means, for passing said cooling fluid into said upper room from said tubular means to reserve said cooling fluid in said upper room; and

a positive pressure valve removably installed in said tubular means, for opening itself to allow escape of said cooling fluid into said upper room through said cooling fluid passing means when the pressure in said lower room exceeds a first predetermined value,

said negative pressure valve being operative to allow flow through itself of said reserved cooling fluid in said upper room into said lower room when the pressure in the lower room becomes lower than a second predetermined value.

4,130,160

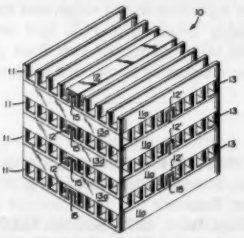
COMPOSITE CERAMIC CELLULAR STRUCTURE AND HEAT RECUPERATIVE APPARATUS INCORPORATING SAME

Chester J. Dziedzic, and Joseph J. Cleveland, both of Dushore, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 27, 1976, Ser. No. 726,950

Int. Cl.[2] F28F *3/00*

U.S. Cl. 165—166 **16 Claims**

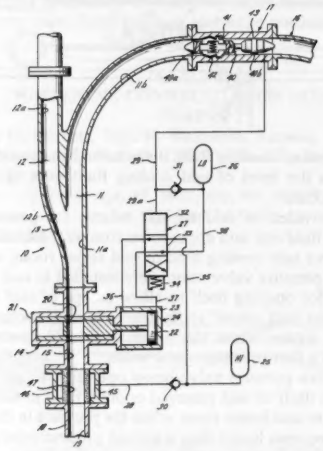


1. A composite cross-flow recuperative ceramic cellular structure, having first and second pairs of opposing faces defining cell openings for the passage of heat transfer fluids, respectively, in directions transverse to one another, the first fluid transferring heat to the second fluid during passage through the cells, whereby each pair of faces has in operation a hot face and a cold face, the hot face of the first pair being the inlet face for the first fluid, and the hot face of the second pair being the outlet face for the second fluid,

characterized in that the ceramic cellular structure is a com-

posite of a plurality of sectioned stacked ribbed layers, the layer sections in abutting relationship, the layers stacked so that the ribs of alternate layers are transverse to one another, and sealing means between abutting layer sections, the sealing means substantially preventing leakage of heat transfer fluids between adjacent layers.

4,130,161
UNDERWATER CHRISTMAS TREE
Marvin R. Jones, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.
Filed Sep. 6, 1977, Ser. No. 830,797
Int. Cl.[2] E21B *7/12*
U.S. Cl. 166—337 **7 Claims**



1. Apparatus for controlling flow from an offshore well, comprising an underwater Christmas tree having a production bore through which TFL tools may be passed to and from the well through a flowline connectible with the bore, an auxiliary bore intersecting the production bore to permit wireline tools to be lowered into or raised from the well, valve means for opening and closing the production bore below the intersection of the auxiliary bore therewith in response to fluid pressure at a location above said intersection being respectively above or below a predetermined value, and means for receiving and releasably retaining a TFL tool intermediate said intersection and said location so that fluid pressure at said location may be maintained above said predetermined value.

4,130,162
FLOW-THROUGH MULE SHOE SUB
Paul M. Nelson, Houston, Tex., assignor to Wilson Industries, Inc., Houston, Tex.
Filed Jul. 1, 1977, Ser. No. 812,063
Int. Cl.[2] E21B *17/00, 47/00*
U.S. Cl. 166—243 **4 Claims**

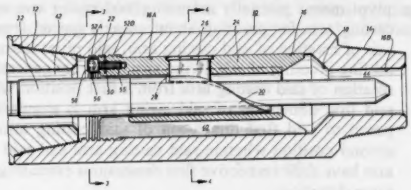
3. A sleeve for supporting a radially inwardly extending key comprising:

a substantially cylindrical member having a predetermined thickness dimension associated therewith and a first and a second axial end thereon;

a plurality of radially inwardly extending ribs disposed on said cylindrical member;

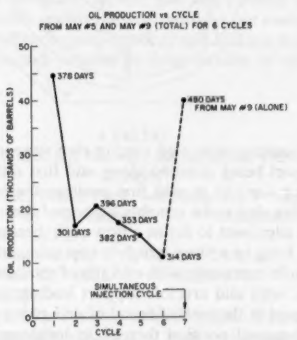
a plurality of screw threads extending circumferentially about the exterior surface of said cylindrical member adjacent said first axial end thereof; and,

one of said ribs having an axially extending opening and a substantially radially extending notch disposed therein,



said notch dividing said plurality of threads into a first and a second set of threads.

4,130,163
METHOD FOR RECOVERING VISCOUS HYDROCARBONS UTILIZING HEATED FLUIDS
Caurino C. Bombardieri, Calgary, Canada, assignor to Exxon Production Research Company, Houston, Tex.
Filed Sep. 28, 1977, Ser. No. 837,114
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—252 **5 Claims**



1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation which is penetrated by at least two wells having a communicating relationship, comprising in combination:

(a) initially injecting a heated fluid at relatively high pressures into said hydrocarbon formation by means of both wells for a relatively short period of time, sufficient to fluidize hydrocarbons therein and produce hydrocarbons upon cessation of said injection, but insufficient to result in fluid breakthrough;

(b) subsequently shutting in one well, and recovering hydrocarbons from the formation by means of the other well;

(c) selecting a minimum production rate from said other well whereby a relatively long production span is established;

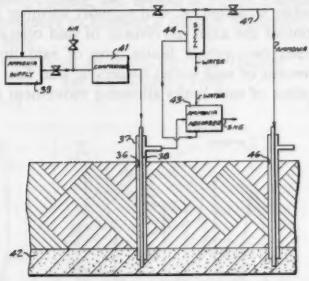
(d) monitoring the production rate of said hydrocarbons from said other well;

(e) after said production rate declines to said minimum rate, along with reduced temperatures of the produced fluids, injecting additional heated fluid into said one well at relatively low pressures over a relatively long time span to create a driving force into the formation by means of said one well and continuing production of hydrocarbons from said other well while continuing said fluid drive but without breakthrough.

4,130,164
PROCESS FOR COAL GASIFICATION

Rabinder S. Datta, Syracuse, N.Y., assignor to Syracuse Research Corporation, Syracuse, N.Y.

Filed Aug. 11, 1977, Ser. No. 823,803
Int. Cl.[2] E21B *43/24, 43/27;* E21C *41/02, 41/04*
U.S. Cl. 166—259 21 Claims



1. An improved process for the gasification of coal, comprising the steps of introducing a member of the group consisting of gaseous anhydrous ammonia, liquid anhydrous ammonia, aqueous ammonia and combinations thereof and methanol into a coal seam, allowing said member to remain in contact with the coal in said coal seam for a long-enough period to increase substantially the permeability thereof to flow of fluid therethrough, removing at least a portion of said member of said group, raising the temperature of at least a portion of the coal in said seam to combustion point and introducing an oxygen-containing gas into said seam under conditions such as to produce a combustible gas from said coal.

4,130,165
METHOD FOR SELECTIVELY PLUGGING WATER ZONES

Clarence R. Fast, and George E. King, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 760,195, Jan. 17, 1977, abandoned. This application May 1, 1978, Ser. No. 901,906
Int. Cl.[2] E21B *33/138, 43/00*
U.S. Cl. 166—279 6 Claims

1. A method for reducing the production of water from an oil production well which penetrates an oil producing formation comprising in the following order the steps of:

(a) injecting gas into said oil producing formation by means of said production well;

(b) injecting a mixture of clean oil and emulsifier into said oil producing formation by means of said production well; and

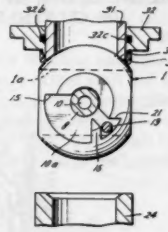
(c) producing fluids from said oil producing formation by means of said production well.

4,130,166
VALVE AND LUBRICATOR APPARATUS

Neil H. Akkerman, New Orleans, La., and Richard J. Ross, Houston, Tex., assignors to Baker International Corporation, Orange, Calif.

Division of Ser. No. 732,937, Oct. 15, 1976, Pat. No. 4,062,406. This application Sep. 26, 1977, Ser. No. 836,348
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—324 1 Claim

1. In a lubricator apparatus for use in installation of drilling, completion, workover tools, or parts thereof for subsequent use in a subterranean well, said lubricator having therein a valve assembly comprising a longitudinally shiftable carriage, a ported valve head rotatable on valve seat means between closed and opened positions by said carriage to control flow of fluid through the well, the improvement comprising: a differential sleeve slidingly disposed around said carriage for reduction of metallic friction, said sleeve being longitudinally movable immediate said valve assembly, said sleeve being sealingly engageable upon the exterior of said ported valve head when said valve assembly is in closed position, said sleeve being sealingly disengageable from said ported valve head when said valve assembly is in open position, said sleeve being urgeable to sealing engagement position upon said ported valve head in response to pressure differential across the valve assembly, said

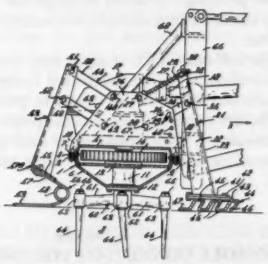


sleeve being in frictionless relationship with said ported valve head in absence of pressure differential across said valve assembly; and reference pressure operated means in conduit communication with said valve assembly for rendering the said valve assembly insensitive to hydrostatic pressure at the depth of the operation of said valve assembly, said reference pressure operated means further enabling control pressure to rotate said ported valve head operatively independent of well pressure.

4,130,167
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Nov. 30, 1976, Ser. No. 746,086
Claims priority, application Netherlands, Dec. 1, 1975, 7513962
Int. Cl.[2] A01B *27/00, 33/14*
U.S. Cl. 172—40 6 Claims



1. A soil cultivating implement comprising a frame and a plurality of tined soil working members being mounted for rotation about upwardly extending axes defined by corresponding shafts supported on said frame, driving means connected to said shafts and adjacent working members being rotated in relative opposite directions, the shafts of adjacent soil working members being spaced apart and the tines of adjacent soil working members being positioned to work overlapping paths, soil crumbling means being connected to said implement and comprising at least one elongated soil crumbling member that extends transverse to the direction of travel, said driving means engaging said soil crumbling member and moving same upwardly and downwardly with respect to said frame to further crumble soil worked by said rotatable working members during operation, said driving means including driven vibratory means that vibrates the crumbling member in substantially upward and downward directions, said crumbling

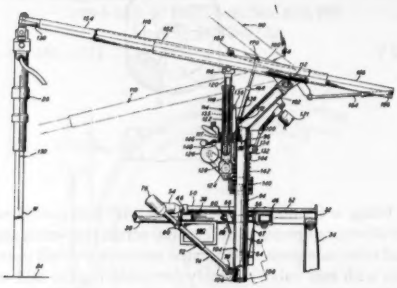
member being pivoted to the frame by at least one parallelogram linkage and comprising a plurality of rib-like portions arranged one behind the other.

4,130,168

DOWNCROWDING BOOM ASSEMBLY

Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Filed Oct. 13, 1976, Ser. No. 732,076
Int. Cl.² E21C *5/00*
U.S. Cl. 173—38 **21 Claims**



11. A self-contained, straight-line, downcrowding boom apparatus comprising: a base frame; a pedestal adjustably carried by said base frame for adjustably positioning a generally upright swing axis for said pedestal in all planes relative to the base frame; a swing post journalled by said pedestal for rotational movement about said upright swing axis; a laterally extending boom secured to the swing post for pivotal movement about a horizontal pivot; means to pivot said boom about said horizontal pivot through a predetermined, vertically disposed arc; a telescoping boom member carried by said boom and having a crowding end thereon extending from said boom and pivotable therewith; and means to automatically and positively move the crowding end of said telescoping boom member when pivoting the boom through the predetermined arc, whereby the crowding end follows a straight line downcrowding course.

12. The self-contained, straight line, downcrowding boom apparatus of claim **11**, which further comprises a power storage means and wherein the means to pivot said boom comprises a power means to energize the power storage means for downcrowding a tool mounted on said boom to continue a downcrowding load on the tool after said power means is stopped.

4,130,169

DOWNHOLE CONNECTOR FOR USE WITH DRILL STRING TELEMETERING SYSTEM

Early B. Denison, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 22, 1977, Ser. No. 790,158
Int. Cl.² E21B *1/10, 47/02*
U.S. Cl. 175—299 **16 Claims**

1. A combination remotely-operable connector and jar means for both electrically and mechanically coupling a wireline to a remote companion connector located in a drill string, said connector comprising:

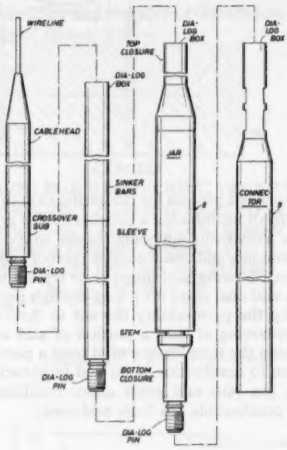
a support member;

a plurality of collet fingers mounted on said support member, said collet fingers being movable between first and second positions, in one position said collet fingers being engaged with a fish neck formed on said companion connector; and in the second position, the collet fingers being disengaged from said fish neck;

one-half of an electrical connector mounted on said support member, and disposed to electrically couple with the mating half of the electrical connector mounted on said companion connector;

an operating member mounted on said support member and axially movable relative to said support member, said operating member having a tapered surface disposed adjacent said collet fingers, said tapered surface moving said collet fingers to an engaged position with respect to said fish neck when said operating member is moved axially;

cam means mounted on said support member and disposed to control the axial movement of said operating member between two preset limits, one of said limits allowing movement of said collet fingers to said first position and the other of said limits allowing movement of said collet



fingers to said second position, said cam means being operable by sequentially applying and releasing tension on said wireline;

spring-actuated down jar means, said jar means being coupled to said operating member, said jar means being cocked by applying tension to said wireline and tripped by releasing tension from said wireline; and

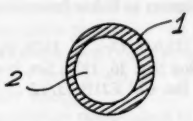
an electrical cable disposed to pass through said support and operating members, said cable being coupled at one end to said one-half of the electrical connector and at the other end to a second electrical cable, said second electrical cable disposed to pass through said jar means and electrically couple to said wireline.

4,130,170

PROBE FOR USE IN GEOLOGICAL SURVEYS

Ronald H. C. Holman, Clonee, Ireland, assignor to Barymin Explorations Limited, Toronto, Canada

Filed Feb. 8, 1977, Ser. No. 766,824
Int. Cl.² E21B *9/20*
U.S. Cl. 175—245 **9 Claims**



1. A probe for extracting samples from below the surface of the earth, said probe comprising an elongated body having a smooth bottom annular surface, a hollow core in the elongated body, the elongated body and the hollow core having respective longitudinal axes which are inclined at a small angle to one another such that the hollow core extends from one end of the

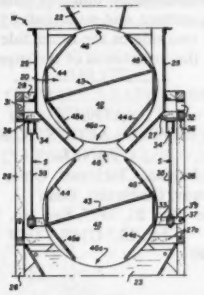
body to one side thereof, the said probe further comprising means at the other end of the body adapted for engagement with a drive rod of a powered hammer mill.

4,130,171

APPARATUS FOR BATCH-WEIGHING A CONTINUOUS FLOW OF MATERIAL

James M. Smith, Golden, and Wilson S. Howe, Longmont, both of Colo., assignors to Industrial System Engineers, Inc., Englewood, Colo.

Filed Aug. 18, 1976, Ser. No. 715,294
Int. Cl.[2] G01G *11/04*
U.S. Cl. 177—1 **11 Claims**



1. A method for rapidly weighing a continuous flow of material which drops into a holding container and loads from the holding container drop into a weighing container which vibrates when so loaded, with a transducer means carrying the container to convert weight and vibrational effects to an electrical output and with a computer means to convert the electrical output at any instant to a digital value and perform other computer operations, including the steps of:

(a) permitting the holding container to receive and retain the flowing material until a load is accumulated therein;

(b) dropping the load into the weighing container and permitting the initial peak vibrations of the container to attenuate to a more nearly uniform vibration pattern at a regular frequency;

(c) thereupon, converting the transducer means output to a sequence of digital values at short time intervals in the general range of microseconds, and which are substantially less than the time intervals of the vibration frequency imposed upon the transducer means by the container;

(d) continuing this conversion for a short time interval in the general range of one-half second;

(e) averaging the sum of the digital values during said time interval and placing this average value in the display and/or memory of the computer; and

(f) dropping the load from the weighing container and positioning the weighing container to receive another load before another load is accumulated in the holding container.

4,130,172

ELECTRIC VEHICLE

Warren E. Moody, 95 Fiesta Way, Fort Lauderdale, Fla. 33301

Continuation-in-part of Ser. No. 588,841, Jun. 20, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,721
Int. Cl.[2] B60K *1/00, 17/04;* B60L *15/20*
U.S. Cl. 180—65 E **11 Claims**

1. A differential electric motor drive for driving a vehicle comprising:

a vehicle frame:

a drive wheel assembly, including a dead axle shaft; a pair of vehicle drive wheels rotatably mounted at opposite ends of the dead axle shaft, and elastic support means for supporting the vehicle frame on the dead axle;

a motor supporting frame mounted on the vehicle frame;

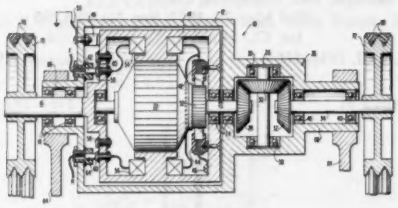
a first motor element rotatably mounted within said supporting frame and having means for creating an electric field therein;

a second motor element rotatably mounted within said first motor element;

each motor element having a motor element output shaft extending from one end thereof in opposite directions;

a final output shaft connected to one of said motor element output shafts;

a reverse mechanism for effecting said connection between said one motor element output shaft and said final output shaft in a 1:1 relationship for compensating for relative opposite rotation of said motor elements, the other motor element shaft and said final output shaft being connected by power transmission means to the vehicle drive wheels,



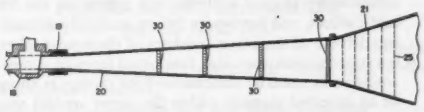
and said power transmission means connecting said drive wheels to said motor drive comprising two pairs of cooperating driving and driven pulleys, the driving pulley of one pair being mounted on the final output shaft, the driving pulley of the other pair being mounted on the other motor element shaft, and the driven pulley of each pair being mounted on a respective one of said drive wheels, said pairs of cooperating pulleys being connected by suitable belt means, and adjustable means between the motor supporting frame and said dead axle shaft for maintaining proper spaced apart relation and tension between said belts and said pulleys; said means for creating an electric field within the first motor element includes: a first field coil for rotating the second motor element in one direction relative to the first motor element to effect forward movement of the vehicle; and a second field coil for rotating the second motor element in an opposite direction relative to the first motor element to effect backward movement of the vehicle.

4,130,173

APPARATUS AND METHOD FOR REDUCING FLOW DISTURBANCES IN A FLOWING STREAM OF COMPRESSIBLE FLUID

James M. Cooksey, Irving, Tex., assignor to Vought Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 185,514, Oct. 1, 1971, abandoned. This application Jul. 7, 1975, Ser. No. 593,827
Int. Cl.[2] F01N *1/00, 1/08*
U.S. Cl. 181—212 **8 Claims**



1. Apparatus for controlling reduction of pressure in a flowing compressible fluid comprising:

(a) conduit means having a central axis,

(b) an inlet valve and an exit throat at opposite ends of said conduit means,

(c) a plurality of choke means positioned at spaced locations within said conduit, the number and characteristics of said choke means determined by

$$r^n = A_o/A_{v_{max}}$$

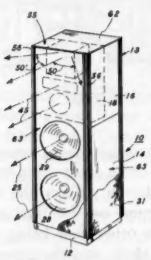
where r is the desired pressure ratio across each choke means when gas is flowing through said exit throat at sonic velocity, n is the number of said choke means, A_o is the exit throat area, and $A_{v_{max}}$ is the full open area of the inlet valve.

4,130,174

LOUDSPEAKER

Walter M. Ostrander, Bridgewater; Malcolm M. Scholl, Bethlehem, both of Conn.; Edward R. Minott, Ellsworth, Me., and Christopher D. Smith, New Milford, Conn., assignors to Audioanalyst, Inc., Brookfield, Conn.

Filed May 25, 1977, Ser. No. 800,205
Int. Cl.[2] H05K *5/00*; A47B *81/06*
U.S. Cl. 181—146 **19 Claims**



1. A loudspeaker comprising:

(A) a cabinet having a lower portion, an upper rearwardly positioned backing compartment, and having an upper frontally disposed recess;

(B) at least one low frequency speaker frontally mounted to the lower portion of the loudspeaker cabinet with vertical alignment of the driver portion of each speaker;

(C) a frontal block dimensioned for receipt within the recess in the upper frontal portion of the loudspeaker cabinet, said block having a central recess and an upwardly protruding open-ended second recess, said block fabricated from a substantially acoustically transparent material;

(D) a mid-range and high frequency baffle compartment dimensioned for interfitting within the central recess of the frontal block and having a frontally disposed mounting plate and a rearwardly positioned backing block, said backing block fabricated from an acoustically absorbent material;

(E) a mid-range speaker mounted to the mounting plate of the baffle compartment so as to have a radiating pattern substantially aligned with the axis normal to the front of said cabinet, and having its driver vertically aligned with the drivers of the other speakers of the loudspeaker;

(F) a high frequency speaker mounted to the mounting plate of the baffle compartment so as to have a radiating pattern substantially aligned with the axis normal to the front of said cabinet, and having its driver vertically aligned with the drivers of the other speakers of the loudspeaker;

(G) a supertweeter cartridge fabricated from an acoustically transparent material dimensioned for receipt in an upright or an inverted manner within the upper second recess of the frontal block and having a recess formed therein dimensioned for receipt of a supertweeter, said supertweeter recess positioned angularly away from the axis normal to the front portion of the loudspeaker cabinet so as to have an orientation favoring one side of the cabinet when mounted in the upright manner, and favoring the other side when mounted in the inverted manner; and

(H) a supertweeter dimensioned for placement within the recess of the supertweeter cartridge at substantially the same angular displacement that the supertweeter recess makes with the normal axis of the loudspeaker, the supertweeter having its driver vertically aligned with the driver of the remaining speakers of the loudspeaker;

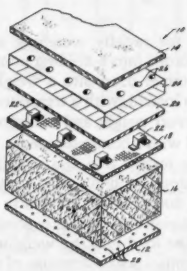
whereby the loudspeaker incorporates low frequency, midrange, and high frequency components vertically aligned with each other to minimize phase distortion and to yield precise imaging with minimal coloration, and incorporating a supertweeter angularly disposed with respect to the remaining speakers of the loudspeaker in order to yield a high frequency radiating pattern of substantially uniform polar response for the central radiating pattern and an angularly disposed radiating pattern to either one side or the other side of the loudspeaker depending upon the orientation of the supertweeter cartridge.

4,130,175

FLUID-IMPERVIOUS ACOUSTIC SUPPRESSION PANEL

Horst W. W. Hehmann, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 21, 1977, Ser. No. 779,776
Int. Cl.[2] G10K *11/04*
U.S. Cl. 181—290 **8 Claims**



1. A multilayered acoustic suppression panel comprising:

a layer of a bulk absorber;

a flexible, fluid impermeable membrane covering said bulk absorber;

means for spacing said membrane from said bulk absorber to form a space therebetween so that said membrane can vibrate and be essentially acoustically transparent;

a perforated plate partially sandwiching said membrane, said plate having a porosity great enough to permit said membrane to be essentially acoustically transparent in the presence of acoustic waves; and

an acoustically hard backing sheet for said bulk absorber.

4,130,176

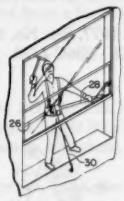
COMBINATION SAFETY BELT AND SAFETY LINE

Roy W. Paulie, 5375 Duke St., Alexandria, Va. 22304

Filed Apr. 19, 1978, Ser. No. 897,700
Int. Cl.[2] A62B *1/18, 35/00*
U.S. Cl. 182—4 **5 Claims**

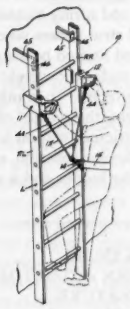
1. A safety belt comprising, in combination, a waist belt, a pair of straps secured to said waist belt for attaching said belt to a supporting surface, a housing secured to said belt intermediate said belt portions, said housing having first and second side walls, a shaft rotatably mounted intermediate said side walls and having first and second ends extending through and beyond said side walls, a safety line wound on said shaft, said safety line having one end secured to said shaft and another end provided with a hook for attaching said cord to a support-

ing surface and means for winding said safety line on said shaft, comprising a ratchet wheel mounted intermediate said first end



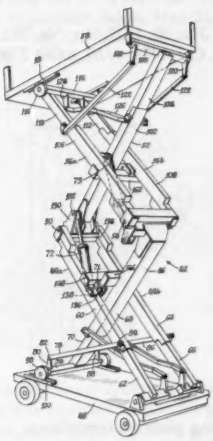
engaging a pawl pivoted on said first side wall, a hand wheel attached to said first end, gear reduction means intermediate said second end and a hand crank on said second end.

4,130,177
LADDER CLIMBER'S SAFETY DEVICE
James E. Pandolph, 11970 SW. 174 St., Miami, Fla. 33177
Filed Jul. 15, 1977, Ser. No. 816,376
Int. Cl.[2] E06C *7/18*; A62B *1/16*
U.S. Cl. 182—8 **4 Claims**



1. A ladder climber's safety device for use with stationary ladders of the type having side rails of rectangular cross-sectional configuration comprising, in combination, a pair of sliding lock handle members, a top-to-bottom through opening in each of said sliding lock handle members for the sliding reception therein of one each of the side rails of the stationary ladder, manual grip means extending laterally outwardly of each of said sliding lock handle members, a cable loosely interconnecting said sliding lock handle members and permitting independent relative sliding movement of said sliding lock handle members along their respective ladder rails, said sliding lock handle members each comprising means for frictionally gripping their respective ladder rails to prevent downward sliding movement therealong when said sliding lock handle members are rotated downwardly with respect to their ladder rails towards the front of the ladder for preventing free downward movement thereof, means controlled by the manual rotation of said sliding lock handle members in the opposite direction with respect to their ladder rails to release said gripping action and permit free upward movement of said sliding lock handle members along their respective rails as controlled by the climber in climbing or descending the ladder, said manual gripping means extending forewardly with respect to the ladder rails along which they are slidingly disposed, said sliding lock handle member gripping means comprising toothed rail grip members fixed with respect to front and back wall portions, respectively, of said top-to-bottom through opening, near lower and upper end portions thereof, respectively, the width of said top-to-bottom through opening being somewhat greater than the width of the front to back width of the associated ladder to permit said rotative rocking motion of said sliding lock handle member with respect thereto, said gripping action release means comprising a pair of roller wheels journalled within said top-to-bottom through opening for protrusion therewithin beyond surfaces defined by said front and back wall portions, respectively, of said top-to-bottom through opening, near upper and lower end portions thereof, respectively, said lower roller wheel being so disposed and of such size as to preclude its contact with the associated ladder rail when the sliding lock handle member is frictionally gripping the rail, said upper roller wheel being journalled at the upper end of an elongated carrier member the lower end of which is pivotally journalled within said top-to-bottom through opening, and means resiliently urging said roller wheel carrier member in the inward direction with respect to said top-to-bottom through opening for yieldingly urging said sliding lock handle members in said downwardly rotated positions.

4,130,178
ELEVATING DEVICE
Raymond E. Smith, Jr., 385 E. Greenwood, Lake Forest, Ill. 60045
Filed Mar. 28, 1977, Ser. No. 782,183
Int. Cl.[2] E04G *1/22*
U.S. Cl. 182—141 **16 Claims**



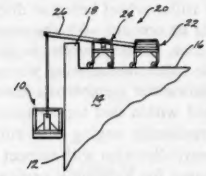
1. An elevating device comprising:
a pair of pivotable legs disposed in a scissors arrangement, each leg including a telescoping section and terminating in an end;
means for pivoting said legs; and
means interconnecting the end of each leg with the telescoping section of the opposite leg for effecting extension of said telescoping sections in response to the pivoting of said legs without imparting substantial horizontal movement to the ends of said legs.

4,130,179
PORTABLE SUPPORT FOR A SCAFFOLD
Albert Williams, 4506 Laurel Ave., Omaha, Nebr. 68104
Filed Nov. 14, 1977, Ser. No. 851,362
Int. Cl.[2] E04G *3/10*
U.S. Cl. 182—142 **3 Claims**

1. A portable support for a scaffold, comprising, a first portable support member,
a plurality of weights on said first support member,
an elongated member having one end pivotally connected to said first support member,
a second portable support member spaced from said first support member,

said elongated member being connected, intermediate its length, to said second support member,

the other end of said elongated member being adapted to support a scaffold extending downwardly therefrom,



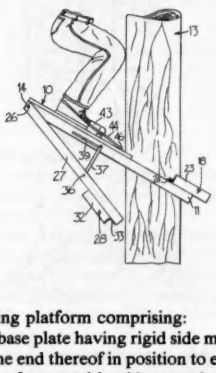
said elongated member being selectively vertically secured to said first support member.

4,130,180

TREE CLIMBING PLATFORM

James B. Ferguson, Rte. 3, Box 14A, Falkville, Ala. 35622; Ernie B. Ferguson, 1156 Crestfield La., Hixson, Tenn. 37343, and Clarence E. Ferguson, Rte. 2, Box 241A, Hartselle, Ala. 35640

Filed Jan. 25, 1977, Ser. No. 762,243
Int. Cl.[2] A47C *9/10*; A63B *27/00*
U.S. Cl. 182—187 **10 Claims**



1. A tree climbing platform comprising:

(a) a horizontal base plate having rigid side members projecting beyond one end thereof in position to extend alongside opposite sides of a tree with said one end of said base plate being out of operative engagement with and spaced from the adjacent side of said tree so that no force is transmitted from said one end of said base plate to the side of said tree adjacent thereto and the other end of said base plate extending away from said tree,

(b) a first transverse blade carried by said rigid side members in position to bite into the opposite side of a tree from the side thereof nearest said one end of said base plate,

(c) a frame member pivotally connected at one end thereof to said other end of said base plate in spaced relation to said one end of said base plate and disposed to extend downwardly and inwardly beneath said base plate,

(d) a second transverse blade carried by the inner end of said frame member in position to bite into the side of a tree opposite the side thereof engaged by said first transverse blade,

(e) means carried by said base plate for detachably attaching said base plate to the feet of a person standing thereon, and

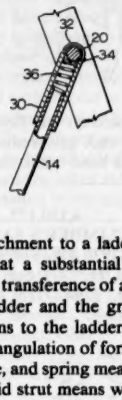
(f) locking means operatively connecting said frame member to said base plate and adapted to retain said inner end of said frame member and said base plate at fixed positions relative to each other.

4,130,181

LADDER SUPPORT SYSTEM

William J. P. McCallum, R.R. #2, Hillsburgh, Ontario, Canada (N0B 1Z0)

Filed May 25, 1977, Ser. No. 800,520
Int. Cl.[2] E06C *1/20*
U.S. Cl. 182—169 **1 Claim**



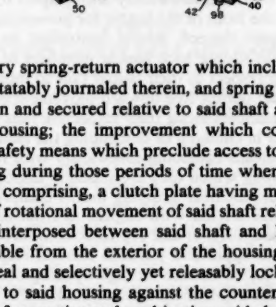
1. Strut means for attachment to a ladder intermediate the ends thereof, to extend at a substantial angle between the ladder and the ground for transference of a significant supporting force between the ladder and the ground; tie means for connecting the strut means to the ladder adjacent the lower end thereof to provide triangulation of forces in a substantially vertical plane, when in use, and spring means permitting predetermined shortening of said strut means when under compression to permit predetermined limited bowing deflection of the ladder towards the ground under the weight of the user before the strut means becomes effective to transfer load from the ladder to the ground whereby the weight of a user is substantially fully applied in unrestricted relation to the upper end of the ladder, to develop optimum reaction and friction forces between the upper end of the ladder and a surface supporting said ladder upper end.

4,130,182

ROTARY SPRING-RETURN ACTUATOR WITH SAFETY FEATURE

Dale Aunspach, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Jul. 7, 1977, Ser. No. 813,619
Int. Cl.[2] F03G *1/06*; F16K *31/04*
U.S. Cl. 185—45 **11 Claims**



1. In a rotary spring-return actuator which includes a housing, a shaft rotatably journaled therein, and spring means interposed between and secured relative to said shaft and the interior of the housing; the improvement which comprises the provision of safety means which preclude access to the interior of the housing during those periods of time when the shaft is spring loaded comprising, a clutch plate having means to limit the amount of rotational movement of said shaft relative to said clutch plate interposed between said shaft and housing and means accessible from the exterior of the housing to simultaneously conceal and selectively yet releasably lock said clutch plate relative to said housing against the counterforce of the spring means for continuously subjecting said shaft to prede-

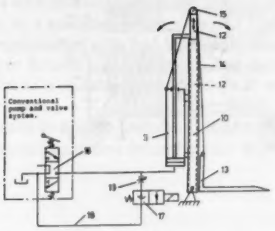
termined spring tension when the clutch plate is locked relative to the housing, and wherein the spring tension is dissipated incident to rotation of the shaft and clutch plate when the clutch plate is released from a locked relationship with respect to the housing.

4,130,183

CONTROL SYSTEM FOR SELECTIVE POSITIONING OF A DISPLACEABLE DEVICE

Erik Tjörnemark, Tåstrup, Denmark, assignor to Islef & Hagen A/S, Denmark

Filed Apr. 26, 1976, Ser. No. 680,580
Claims priority, application Denmark, Apr. 30, 1975, 1893/75
Int. Cl.[2] G05B *19/26*
U.S. Cl. 187—9 R **16 Claims**



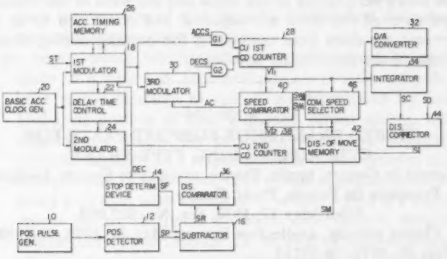
1. In a control system for a conventional apparatus which includes a movable means to be selectively positioned at a selected one of a plurality of locations, guide means cooperating with said movable means to guide the latter for movement with respect to said guide means to said plurality of locations, drive means operatively connected with said movable means for moving the latter with respect to said guide means, and manually operable means having operating and rest positions to each of which said manually operable means is at any time movable by the operator, said manually operable means being operatively connected with said drive means for rendering the latter operable when said manually operable means is in in said operating position thereof and for blocking said drive means against operation when said manually operable means is in said rest position thereof, said control system comprising electrically-responsive automatic means also connected operatively with said drive means and also having operating and rest positions, said automatic means when electrically energized automatically assuming said operating position thereof and cooperating with said drive means for rendering the latter operable, said automatic means when unenergized assuming said rest position thereof and cooperating in the latter rest position thereof with said drive means for blocking the latter against operation, said manually operable means and said automatic means both being operatively connected with said drive means for rendering the latter operable when either one of said manually operable and automatic means is in said operating position thereof even though the other of said manually operable and automatic means is in said rest position thereof, a plurality of normally open positioning switch means carried by said guide means and distributed therealong at locations corresponding to the positions of said movable means to be selected, said movable means carrying a switch-closing means cooperating with said plurality of positioning switch means for respectively closing said plurality of positioning switch means when said movable means is respectively situated at said positions which are to be selected, an electrical circuit including said plurality of positioning switch means and said electrically-responsive automatic means, and a plurality of manually operable selecting switch means also located in said electrical circuit and respectively connected in series with said plurality of positioning switch means, said plurality of selecting switch means respectively corresponding to the positions of said movable means to be selected so that the operator will close one of said selecting switch means corresponding to the selected position for said movable means, whereby the operator can operate said manually operable means to render said drive means operative to move said movable means at least approximately to a selected position where said switch-closing means closes that one of said plurality of positioning switch means which corresponds to the selected position of said movable means, while the selecting switch means corresponding thereto has been previously closed, so that when said movable means has been displaced at least approximately to said selected position said automatic means will be energized to render said drive means operative even though the operator has returned said manually operable means to said rest position thereof, said drive means continuing to operate until said switch-closing means moves with respect to the closed positioning switch means to a location opening the latter, whereupon said automatic means automatically assumes said rest position thereof blocking further operation of said drive means and thus maintaining said movable means in the selected position.

4,130,184

ELEVATOR SPEED CONTROL SYSTEM

Tsuyoshi Satoh, and Kenzo Tachino, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1977, Ser. No. 799,314
Claims priority, application Japan, May 27, 1976, 51-61595
Int. Cl.[2] B66B *1/30*
U.S. Cl. 187—29 R **7 Claims**



1. An elevator speed control system comprising, in combination, first speed pattern generator means for generating a command speed pattern, second speed pattern generator means for generating a second speed pattern delayed a predetermined time interval with respect to said command speed pattern during the acceleration, distance-of-movement calculating means for calculating theoretical distances of movement due to said command speed pattern, memory means for writing and reading said calculated theoretical distances of movement into and out from the same, said memory means successively storing said second speed pattern concerning said theoretical distances of movement in the form of a distance-to-speed function during the acceleration, and means for utilizing said second speed pattern stored in said memory means to generate a command deceleration pattern during the deceleration.

4,130,185

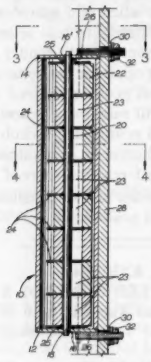
POLE VIBRATION DAMPER

Russell A. Densmore, Dublin, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sep. 12, 1977, Ser. No. 832,692
Int. Cl.[2] F16F *7/10*
U.S. Cl. 188—1 B **10 Claims**

1. A vibration damper for pole structures and the like comprising in combination with a pole structure a housing affixed to the pole structure and a plurality of metal vibration damping discs of smaller outer peripheral dimensions than the interior cross section of said housing mounted for controlled and lim-

ited movement within the housing, each of said discs being provided with a centrally disposed aperture, means for loosely and vertically stacking said discs within said housing including a rod means which is centrally and vertically disposed within the housing and which is insertable within the apertures of said discs, said rod means having a substantially smaller outer peripheral dimension than the peripheral dimensions of the various disc apertures, and apertured washer means of a different material from said discs mounted on said rod means between adjacent discs and providing slippery contact surfaces and separators between adjacent discs wherein the relative sizes of the outer peripheries of the discs and the sizes of the central apertures of the discs are adjusted and correlated so as to prevent the discs from contacting the housing during movements of the same in the housing.



4,130,186

RIBBED BRAKE SHOE SUPPORT PLATE FOR CYLINDRICAL RING TYPE BRAKE

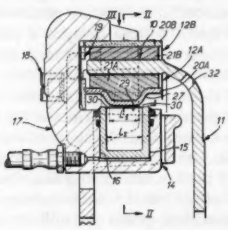
Gérard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed May 17, 1976, Ser. No. 687,093

Claims priority, application France, May 20, 1975, 75 15587; Mar. 30, 1976, 76 09113

Int. Cl.[2] F16D *53/00*

U.S. Cl. 188—76 **15 Claims**



1. A brake shoe for a ring type brake having a cylindrical brake ring comprising a generally part-cylindrical support plate having remote faces defining a convex surface and a concave surface, a brake lining on one of the faces of said support plate and at least one elongate protruding rib on the opposite face of said support plate, said rib extending substantially from one edge of said support plate to an edge opposite thereto and comprising two lateral surfaces joining said rib to said opposite face of said support plate and a substantially planar surface interconnecting said lateral surfaces and extending only between said lateral surfaces to define the sole bearing surface on said opposite face of said support plate adapted to bear against actuating means for said brake shoe, said two lateral surfaces and said planar surface of said rib defining a depression in said support plate and said brake lining having a portion projecting into said depression and forming a mechanical interlock with said support plate.

4,130,187

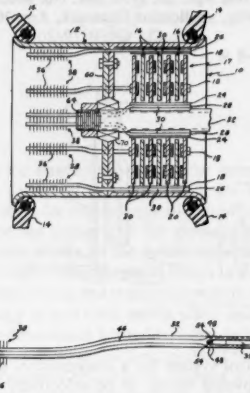
SYSTEM FOR THERMAL ISOLATING OF BRAKES

Lawrence L. Midolo, 1475 Black Oak Dr., Centerville, Ohio 45459

Filed Sep. 28, 1977, Ser. No. 837,136

Int. Cl.[2] F16D *65/853*

U.S. Cl. 188—264 CC **4 Claims**



1. An apparatus for thermally isolating the brakes from the tire and axle bearing in an aircraft wheel having an axle member, a rim member, a brake member, with the brake member having rotor members and stator members; a plurality of key members for securing the brake rotor members to the rim member and the stator members to the axle member; comprising: a plurality of elongated heat transfer members; each of said heat transfer members having a sealed tubular chamber; a heat resistant wick member adjacent the wall at one end of the heat transfer member; means, at the end of said chamber remote from said wick member for removing heat from said chamber; a solution within said chamber; a tubular membrane, permeable only to the solvent, of said solution, supported within said chamber at the end of the chamber adjacent the heat removing means; said tubular membrane being spaced from the wall of the tubular chamber; a liquid transfer passage connected between the tubular membrane and the wick member; a solvent vapor transfer passage between said wick member and the space between the tubular member and the tubular membrane; said key members each having a longitudinal chamber therein; each of said elongated heat transfer members having its wick end extending into said longitudinal chambers in said key members; the end of said elongated heat transfer member having said heat removing means being positioned on the side of said aircraft wheel remote from said brake member.

4,130,188

BRAKING DEVICE FOR A MOTOR

Crawford S. Askew, 5120 SW. 98th Ave. Rd., Miami, Fla. 33165

Continuation-in-part of Ser. No. 625,454, Oct. 23, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 820,743

Int. Cl.[2] F16D *59/02*

U.S. Cl. 188—170 **11 Claims**

1. A fluid operated brake device for an electric motor, including a housing with the motor shaft extending into the housing, the shaft having a brake disc fixed thereto within the housing, and including brake ring means carried in said housing, constrained against rotational movement and free for axial

movement into and out of braking engagement with the disc, said brake device comprising,

a fixed mounting plate on the housing;

a movable mounting plate in a spaced apart, pivotal relation to said fixed mounting plate;

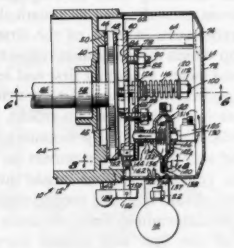
brake stud means adjustably fixed to said movable plate for movement into and out of engagement with the brake ring means;

compression spring means to normally maintain said movable plate in a first position with said brake stud means in engagement with the brake ring means to maintain a braking engagement with the brake disc;

a plunger movable between a normally retracted position, permitting said compression spring means to maintain said braking engagement, and an extended position in engagement with said fixed mounting plate to pivot said movable plate to a second position with said brake stud means out of engagement with said brake ring means;

means to actuate said plunger to said extended position by means of a suitable pressurized fluid when the motor is energized;

said means to actuate includes a diaphragm housing, including mounting means mounting said diaphragm housing on



said movable plate, and providing an inner chamber with a diaphragm spanning said chamber, said diaphragm housing provides an inlet port into said chamber on a first side of said diaphragm, said plunger extends inwardly through said mounting means and terminates in an enlarged head portion within said chamber, engaged against a second side of said diaphragm; said means to actuate further includes a normally closed solenoid actuated valve, wired in parallel with the motor to maintain said valve in an open position when the motor is energized, providing a flow of pressurized fluid through said inlet port against said diaphragm first side to displace said diaphragm in a manner so as to maintain said plunger in said extended position, said pressurized fluid flow being interrupted when said motor is de-energized permitting said valve to assume its normal closed condition and said plunger to move to said retracted position;

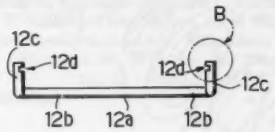
an adjustable metering valve including manual control means, associated with said solenoid actuated valve, disposed in an exhaust passage in said solenoid actuated valve to control the rate of flow of pressurized fluid out of the diaphragm housing through said exhaust passage via said inlet port and the resulting speed rate of the braking operation of the brake device.

4,130,189

RETURN SPRING OF A DRUM BRAKE USED IN A VEHICLE

Masayoshi Katagiri, and Ziro Kizaki, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 14, 1977, Ser. No. 842,159
Claims priority, application Japan, Jun. 13, 1977, 52-69652
Int. Cl.² F16D *51/24*
U.S. Cl. 188—328 **3 Claims**



1. In a drum brake for vehicle use which includes:

a backing plate secured to a fixedly positioned member on a wheel shaft;

a pair of brake shoes slidably attached to said backing plate, each of said brake shoes including a lining portion and a web portion, each web portion including a hole;

a wheel cylinder disposed between respective first mutually closely positioned end portions of said shoes;

an anchor means doposed between second mutually closely positioned end portions of said shoes;

a substantially U-shaped return spring which includes a U-shaped portion in a given plane and is engaged with each web portion of said shoes for biasing said shoes in a mutually approaching direction;

the improvement wherein said U-shaped return spring is made of a wire rod, each end portion of said rod being bent perpendicularly to said plane determined by said U-shaped portion of said U-shaped return spring, into respective L-shapes for providing respective engaging portions engaged with respective ones of said holes in said web portions of said shoes, each of said engaging portions being provided with a respective notch, which is a single indent having shoulders on either side thereof, formed substantially perpendicular to an axis of said engaging portion in a mutually confronting posture and fitted respectively onto an edge of a respective one of said engaging holes to prevent relative movement of said engaging portions in the axial direction relative to said web portions due to abutment of said web portions on said shoulders, with said U-shaped portion of said U-shaped return spring being spaced from said web portions.

4,130,190

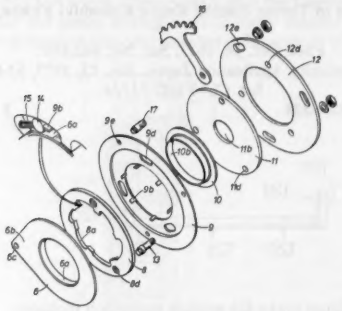
BRAKE ACTUATING DEVICES

David J. Townsend, F1, 37 Dyott Rd., Birmingham B13 9AZ, England

Filed Jan. 24, 1977, Ser. No. 761,905
Int. Cl.² B60T *1/14*
U.S. Cl. 192—5 **9 Claims**

1. A braking means for a pedal actuated vehicle comprising: a first rotatable element and a second rotatable element; a formation between said first and said second rotatable elements, which has engaged and disengaged positions, the position of said formation being determined by the direction of rotation of one of said rotatable elements so that when the formation is in the engaged position the two rotatable elements are caused to rotate together, and when the formation is in the disengaged position the two rotatable elements can rotate relative to one another; a control device for moving the formation to the disengaged position during forward rotation of one rotatable element with respect to the other rotatable element, wherein the control device is arranged so that backward rotation of one rotatable element with respect to the other causes said formation to move to the engaged position; a braking force

transmitting system coupled to a pair of braking force transmitting cables; means for securing one of said rotatable elements



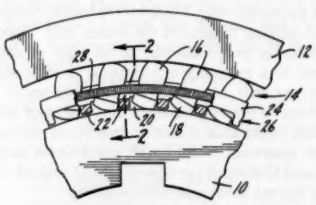
to a rotatable drive member of the pedal actuated vehicle; and means for connecting the other of said rotatable elements to said braking force transmitting system.

4,130,191

SPRAG CLUTCH ASSEMBLY

Carl R. Judd, Ithaca, and Howard D. Snyder, Jr., Newfield, both of N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 17, 1977, Ser. No. 825,326
Int. Cl.[2] F16D 41/07
U.S. Cl. 192—41 A **1 Claim**



1. A sprag clutch assembly especially usable in indexing applications where the indexing rates and degree of accuracy are high comprising:

an inner race and an outer race, said races defining an annular space therebetween;

a plurality of circumferentially spaced sprags in said annular space;

each sprag having a body portion with race engaging surfaces and axially extending footed portions;

each footed portion being defined in part by an upper surface which diverges from said body portion;

said axially extending footed portions being closely adjacent said inner race;

a sprag retainer in said annular space comprising axially spaced rings joined by cross bars, each adjacent pair of cross bars defining an opening in which a footed portion of a sprag is received;

said cross bars being closely adjacent said inner race; and

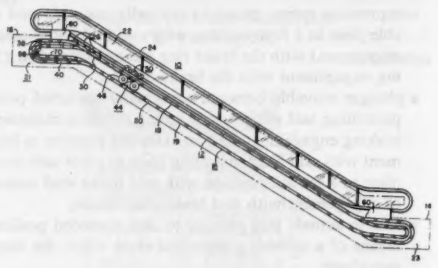
at least one contracting garter spring encircling said footed portions of said sprag and engaging the diverging surfaces thereof.

4,130,192

TRANSPORTATION APPARATUS

Joseph K. Kraft, Dover, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 6, 1976, Ser. No. 748,247
Int. Cl.[2] B66B 9/12
U.S. Cl. 198—327 **10 Claims**



4. Transportation apparatus, comprising:

an endless belt,

a plurality of platforms attached to said belt,

means driving said belt and platforms in a loop, said loop including first and second ends which interconnect load bearing and return runs of said belt and platforms,

and means guiding said belt about said loop including guide wheels and guide tracks,

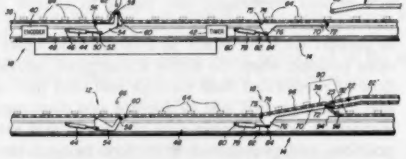
said guide tracks including load bearing and return run tracks, and means providing an automatically adjustable transition therebetween at each of the first and second ends of the loop which means defines turn-arounds for the endless belt, said means including first and second curved members having first ends oriented to provide extensions of the load bearing and return run tracks, respectively, and second ends, means pivotally mounting the first ends of said first and second curved members on first and second pivot axes, respectively, and means interconnecting the second ends of said first and second curved members to provide a predetermined fixed distance between selected points of the first and second curved members without restricting pivotal movement thereof.

4,130,193

TRANSFER SYSTEM FOR CONVEYOR SYSTEMS

Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154

Filed Apr. 25, 1977, Ser. No. 790,466
Int. Cl.[2] B65G 47/46
U.S. Cl. 198—369 **8 Claims**



7. A transfer system for periodically transferring conveyed objects between first and second conveyor systems, each including a conveyor belt, one of said first and second conveyor systems being the transferor system, the other being the transferee system, comprising:

a transfer unit including a rotatable support section for carrying at least a portion of the conveyor belt of the first conveyor system and having a free end and an end rotatably interconnected with the support structure of the first

conveyor system; and a drive mechanism for rotating said support section between a retracted position and an inclined position bridging said first and second conveyor systems with the conveyor belt of the first conveyor system at the free end of said section in close, conveying, proximity to the conveyor belt of the second conveyor system; and

an interrupter unit for producing a gap in the normal flow of product along the one of the first and second conveyor systems which is the transferor system during which said rotatable support section switches between its retracted position and its inclined position, including drive means; and actuator means including a crank mechanism and a cross bar disposed beneath the conveyor belt and fixed to the crank mechanism responsive to said drive means for raising a limited portion of the conveyor belt of the one of the first and second conveyor systems which is the transferor system, to produce an inclination of the conveyor belt to prevent further progress of conveyed objects.

4,130,194

APPARATUS FOR ERECTING AND ALIGNING ARTICLES

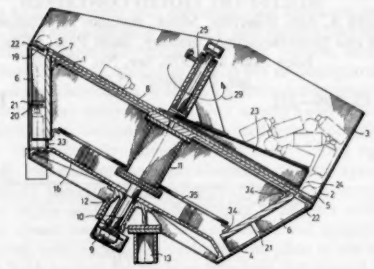
Hugo Schindel, Saulheim, and Karl Mecks, Gau-Odernheim, both of Germany, assignors to Rationator-Maschinenbau GmbH, Hillesheim, Germany

Filed Sep. 30, 1977, Ser. No. 838,087

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651495

Int. Cl.[2] B65G *47/24*

U.S. Cl. 198—397 **10 Claims**



1. An apparatus for erecting elongated shaped articles and for aligning the erected articles, which comprises

(a) a housing defining an open top for randomly receiving a multiplicity of the elongated shaped articles,

(b) a disc mounted in the housing for rotation about an inclined axis of rotation whereby the disc extends in a plane enclosing an angle with the horizontal and the rotating disc has a zenith and nadir, the disc having

(1) a circumferential edge adjacent the housing and the edge defining openings capable of permitting the articles to pass therethrough, and

(2) shafts accociated with the openings and descending therefrom,

(c) a stationary annular support plate mounted in a plane immediately below the plane of the disc and in registry with the openings in the circumferential edge of the disc, the annular support plate defining

(1) an opening at the zenith for permitting communication between a respective one of the openings in the circumferential disc edge and the shaft associated therewith,

(2) the associated shaft at the zenith having a perpendicularly extending axis whereby the randomly received articles gravitate to the nadir, are revolved by the rotating disc to the zenith while supported in the openings on the annular support plate and pass sequentially through the opening at the zenith into the shaft while being erected therein, and

(d) a generally horizontally extending elongated conveyor means for receiving the sequentially erected articles from the shaft at the zenith and for transporting them in alignment away from the shaft.

4,130,195

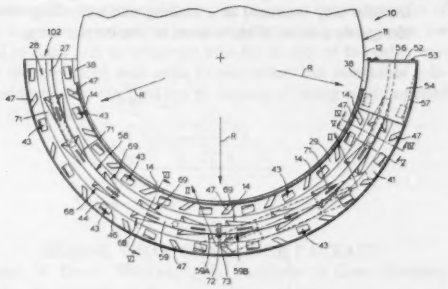
ARCUATE PUSH-BAR CONVEYOR

Roger T. Becker, Kalamazoo; Donald L. Burns, Oshtemo, and Stephen P. Calkins, Three Rivers, all of Mich., assignors to Kalamazoo Conveyor Company, Kalamazoo, Mich.

Filed Apr. 22, 1977, Ser. No. 789,876

Int. Cl.[2] B65G *25/08*

U.S. Cl. 198—739 **16 Claims**



1. An apparatus for conveying material deposited therein, comprising:

an elongated and continuous arcuate trough, the top portion of which is substantially completely open for receiving material along its arcuate length, the centerpoint for the radius of said arcuate trough being located on one side thereof;

arcuate rail means mounted in an extending along an arcuate path in said arcuate trough;

arcuate and rigid slide means slidably mounted on said arcuate rail means, the centerpoint for the radius of the arcuate arrangement of said rail means and said slide means coinciding with the centerpoint of the radius for said arcuate trough;

a plurality of plows mounted on said arcuate slide means at spaced intervals;

reciprocal power means associated with said arcuate trough and driving linkage means for connecting said reciprocal power means to said arcuate slide means and arranged to move said arcuate slide means and said plows thereon back and forth along said arcuate path, said linkage means including guide means for converting the reciprocal drive of said power means into an arcuate drive for said arcuate slide means in both directions of movement thereof;

material retaining means in said arcuate trough encouraging unidirectional movement of said material in said trough by said plows on said arcuate slide means; and

outlet means from at least one end of said arcuate trough for discharging said material from said arcuate trough.

4,130,196

PACKAGE ELEVATOR FOR A SHIP

Randall J. Schwab, Portland, Oreg., assignor to Transco Northwest, Inc., Portland, Oreg.

Filed Dec. 13, 1976, Ser. No. 750,366

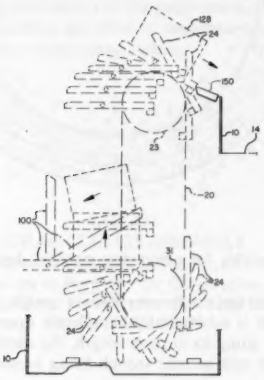
Int. Cl.[2] B65G *17/12*

U.S. Cl. 198—796 **6 Claims**

3. In an elevator,

a pair of endless chains,

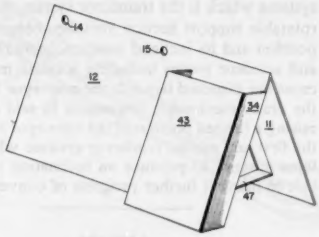
a pair of drive sprockets meshing with the chains and reversing the direction of the chains,
a pair of idler sprockets meshing with the chains and reversing the direction of the chains,
a carrier tray,
a pair of forked followers carried pivotally by the chains and carrying the tray,
each of the followers including an inner arm and an outer arm,
a pair of follower rollers mounted on the arms,
a pair of parallel inner cam track means guiding the rollers on the inner arms,
a pair of outer cam track means guiding the other rollers, the cam track means serving to guide the followers to advance the trays 90° at the idler sprockets and to retard the trays 90° at the drive sprockets,
the carrier tray being comb-like and including a comb-like transfer tray mounted at a loading and unloading station along one course of movement of the carrier tray,



and mounting means for selectively holding the transfer tray in an extended position in the path of the carrier and a retracted position out of that path,
the mounting means including means for holding the transfer tray in a sloping position extending into the path of the carrier tray for unloading a package being lowered by the carrier tray,
the mounting means also including means for holding the transfer tray in a horizontal position adapted to hold a package in the path of the carrier tray for the carrier tray to pick up and raise,
the mounting means including pairs of pins on the transfer tray and a pair of members having forked slots for one pin of each pair,
the pair of members including one pair of forked slots for holding one pair of pins to locate the transfer tray in the horizontal position and a second pair of slots for holding a second pair of pins to locate the transfer tray in the sloping position.

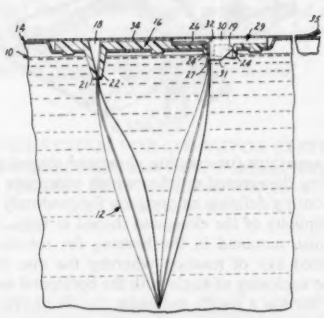
4,130,197
DISPLAY DEVICE
Philip R. Fox, Cincinnati, Ohio, assignor to Midwest Bindery Enterprises, Inc., Cincinnati, Ohio
Filed Dec. 7, 1977, Ser. No. 858,194
Int. Cl.² B65D *5/52*
U.S. Cl. 206—45.26 **9 Claims**

1. A display card blank for forming a display card having an integral pocket, said blank comprising:
(a) a main panel including a foldable glue flap formed therein by a score line and intersecting cut lines;
(b) a first side panel hingedly connected to said main panel by means of a score line parallel to the score line forming one edge of said glue flap;
(c) an inner wall panel hingedly connected to said first side panel by means of a score line, said inner wall panel having its longitudinal dimension equal to the longitudinal dimension of said first side panel;
(d) a second side panel hingedly connected to said inner wall



panel by means of a score line, said second side panel having its longitudinal dimension equal to the longitudinal dimension of said first side panel and parallel thereto;
(e) an outer wall panel hingedly connected to said inner wall panel by means of a score line, said outer wall panel being positioned along a free edge of said inner wall panel; and
(f) closure means for effecting closure at the bottom of said integral pocket.

4,130,198
MULTI-PART LIQUID CONTAINER
Kenneth A. Aho, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Mar. 27, 1978, Ser. No. 890,472
Int. Cl.² B65D *25/08*
U.S. Cl. 206—221 **10 Claims**



1. A container for two fluids to be mixed just prior to use comprising:
a rigid, fluid-tight, primary container having a cover and containing a first fluid, said cover being formed with two spaced parallel slots,
a squeegee comprising a pair of parallel, closely spaced members fixedly positioned in the first of said slots in said cover parallel to said slots and projecting into said container,
an elongate, flexible bag containing a second fluid, said bag passing through said squeegee into said primary container and out of the second of said slots in said cover with one end of said bag projecting from said primary container through said squeegee and the other end of said bag projecting from said primary container through said second slot, and

a strip of tape covering the projecting ends of said bag and removably adhered to said cover around said bag ends, whereby said tape may be removed from said cover, the end of said bag projecting from said primary container through said second slot is permitted to slip through said second slot into said primary container and the end of said bag projecting from said primary container through said squeegee is pulled on to empty the contents of said bag into said primary container, the contents of said bag being substantially completely removed by said squeegee as the bag is pulled therethrough.

4,130,199

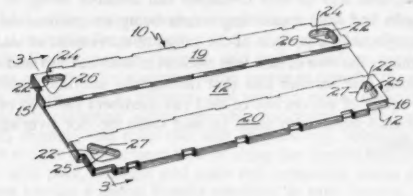
DIE CUT PAD

John F. Sorenson, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 710,449, Aug. 2, 1976, abandoned. This application Jan. 20, 1978, Ser. No. 870,879

Int. Cl.[2] B65D *85/70*

U.S. Cl. 206—320 **1 Claim**



1. A heavy appliance in combination with a support pad for engaging and cushioning said appliance, said appliance having a bottom plate and distended supports, said support pad including a central, substantially rectangular base portion, said base portion having die cut apertures which are so configured and so oriented that they can each receive a distended support from said appliance, said support pad further having a pair of lateral, raised, multilayer cushion members formed from a plurality of hingedly connected flap members which are folded against each other, said cushion members also having die cut apertures for receiving the distended supports of said appliance, the apertures of the cushion members being in register with the apertures of said base portion, said appliance and support pad cooperatiing with each other such that the plate of the appliance lies flush against the cushion members, but spaced apart from the base portion of the pad, and the distended supports of the appliance extend completely through the apertures in the base portion of the pad and are fully accommodated within the apertures of the cushion members of the pad whereby the distal surface of said distened supports lie flush with the bottom surface of said base member.

4,130,200

DISPLAY PACKAGE FOR BATTERIES OR THE LIKE

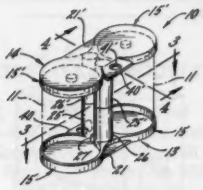
Harry E. Iepson, Lino Lakes, Minn., and Richard A. Erickson, New Richmond, Wis., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 6, 1977, Ser. No. 794,630

Int. Cl.[2] B65D *85/20, 85/62, 7/12*

U.S. Cl. 206—333 **4 Claims**

1. A package for holding and displaying a pair of substantially cylindrical batteries, said package comprising a base unit and an indentically formed top unit each molded of plastic, each of said units comprising a pair of cup-shaped receptacles molded integrally with and spaced horizontally from one another, the receptacles of each unit opening in a vertical direction and having substantially the same cross-sectional size and shape as said batteries, vertically extending post means molded integrally with and located between the receptacles of each unit, a socket opening vertically out of the free end of the post means of each unit, and a stud projecting vertically from the free end of the post means of each unit and sized to telescope securely but releasably into the socket in the post means of the other unit whereby batteries placed in the receptacles of said base unit may be held therein by inverting said top unit with respect to said base unit and by shifting said top unit



downwardly toward said base unit to cause the receptacles of said top unit to telescope over said batteries and to cause the stud of each unit to telescope into the socket of the other unit and thereby hold said units in assembled but releasable relationship so that the package is capable of being easily opened and is reusable.

4,130,201

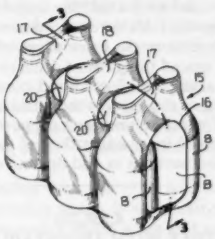
SHRINK WRAP CONTAINER PACKAGE

Joseph W. Duerr, Rockleigh, N.J., assignor to Ganz Brothers, Inc., Bergenfield, N.J.

Filed Oct. 19, 1976, Ser. No. 733,695

Int. Cl.[2] B65D *75/06*

U.S. Cl. 206—432 **3 Claims**



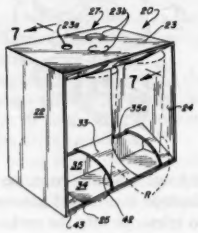
1. A package comprising a plurality of containers each having a base portion and a tapering neck portion, said containers being arranged in two columns and including at least three rows, a sheet of heat shrinkable plastics material film defining a sleeve extending about said containers and open at its ends in the direction of said columns, said sheet being heat shrunk about said containers and tightly fitting about said containers with portions of said sheet enclosing said containers at the ends of said package and defining end openings of limited size as compared to the cross-section of said package, and a slit in said sheet in the direction of said rows between adjacent pairs of rows, said sheet being relieved solely by said slits with each slit having been transformed to a heat shrunk finger receiving opening generally oval in plan between adjacent ones of said rows with said sheet extending inwardly and downwardly about said container tapering neck portions to define a strap of inverted U-section encasing the tapering neck portions of the two containers in the respective row, said straps including a strap tightly engaging upper portions of at least two centrally disposed ones of said containers and defining a lifting strap, said straps each extending in the direction of said rows and extending in about three quadrants of each container tapering neck portion.

4,130,202

CARRIER FOR RECEPTACLES AND BLANK THEREFOR

Charles L. Champlin, Rittman, and John T. Misura, Wadsworth, both of Ohio, assignors to Packaging Corporation of America, Evanston, Ill.

Filed Apr. 13, 1978, Ser. No. 895,994
Int. Cl.[2] B65D 65/10
U.S. Cl. 206—434 17 Claims



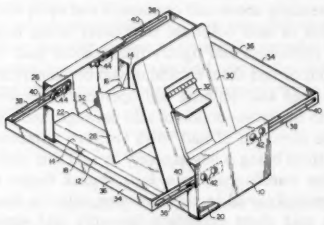
1. A carrier of foldable sheet material for accommodating a plurality of receptacles, said carrier comprising a sleevelike member including a top panel, a bottom panel, and a pair of side panels foldably connecting corresponding first peripheral portions of said top and bottom panels; and receptacle-retaining means provided on opposing surfaces of said top and bottom panels, the retaining means for each opposing surface including a pair of apertured panel sections overlying said opposing surface and adjustable relative thereto between an operative position and an inoperative position, said apertured panel sections having corresponding inner edges integral with and foldably connected to one another and the corresponding outer edges foldably connected to opposite second peripheral portions of said top and bottom panels, one panel section of a pair being provided with a foldline spaced from and substantially parallel to the foldable connection of the outer edge of said one panel section, the inner edges of said pair of panel sections being spaced the greatest distance from the opposing surface when said pair of apertured panel sections is in an operative position, and support means movable independently of said pair of panel sections and supportingly engaging the foldably connected inner edges thereof to effect retention of said pair of panel sections in said operative position.

4,130,203

RECORD TRAY WITH ADJUSTABLE SIDE RAILS

Thomas H. Russell, III, 14 Sulgrave Rd., West Hartford, Conn. 06107

Filed Oct. 17, 1977, Ser. No. 842,941
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—51 5 Claims



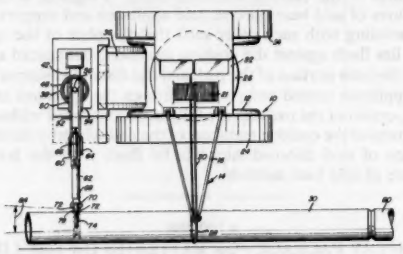
1. A tray for holding a collection of generally rectangular record cards in face-to-face arrangement with their faces generally vertical, said tray comprising a base providing a generally rectangular horizontal support surface with front and rear ends, front and rear walls fixed to said base and extending upwardly from said front and rear ends thereof respectively, and two C-shaped side rail members separate from said base and said front and rear walls and located at opposite sides of said support surface, said two side rail members each having a vertical dimension substantially less than that of said front and rear walls and being spaced in its entirety above said support surface, each of said side rail members including an elongated side rail portion extending horizontally between said front and rear walls and each of said side rail members having two elongated legs at opposite ends of its side rail portion extending horizontally inwardly from said side rail portion into overlapping relationship with said front and rear walls respectively, and connecting means connecting the two of said legs overlapping said front wall to said front wall and the two said legs overlapping said rear wall to said rear wall for rectilinear slidable movement of said legs horizontally relative to said walls and laterally of said base to vary the spacing between said side rail portions, said connecting means including a plurality of threaded fasteners which may be tightened to releasably fix said legs relative to said walls and which may be loosened to free said legs for said rectilinear slidable movement, said legs of said C-shaped rail member being of such lengths and said connecting means being so constructed that throughout one portion of the range of movement of said rail members the two of said legs associated with each of said walls overlap one another and that throughout another portion of the range of movement of said rail members the two of said legs associated with each of said walls do not overlap one another.

4,130,204

SIDE BOOM PIPE LAYING CRANE WITH PIPE SECTION ALIGNMENT FEATURE

Kenneth L. Pickard, 419 S. 106th East Ave., Tulsa, Okla. 74128

Filed Aug. 26, 1977, Ser. No. 828,294
Int. Cl.[2] B66C 23/42
U.S. Cl. 214—1 PA 11 Claims



1. A mobile land vehicle for laying successive pipe sections, said vehicle including a frame having front and rear ends and ground engageable support means for said frame adapted to support and advance said frame from and forwardly over the ground, said frame including longitudinally spaced front and rear support means supported from and projecting outwardly from one side of said vehicle at points spaced therealong, said support means each including pipe section engaging means adapted to engage and support longitudinally spaced portions of a pipe section extending therebetween, said support means each including means operative to selectively adjustably vertically and laterally position the corresponding pipe section engaging means relative to said frame, independent of vertical and/or lateral positioning of the other pipe section engaging means relative to said frame.

4,130,205

LOADING ARM

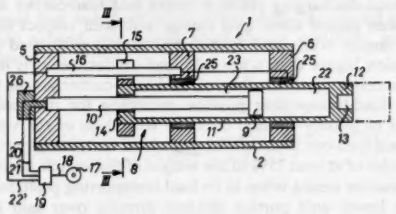
Hans Lüthi, Steffisburg, Switzerland, assignor to Fritz Studer AG., Thun, Switzerland

Filed Dec. 8, 1976, Ser. No. 748,499

Claims priority, application Switzerland, Dec. 9, 1975, 15959/75

Int. Cl.[2] F15B *15/26*

U.S. Cl. 214—1 BB 4 Claims



1. A loading arm apparatus comprising a main rod, support means operable for supporting said rod displaceably along the longitudinal direction thereof, said rod including engaging means operative for engaging work pieces to transfer the same from one position to another, said support means comprising releasable clamping means operable for clamping and accurately aligning said main rod, and, respectively, releasing said main rod for displacement thereof along the longitudinal direction with play, wherein said main rod comprises piston drive means having a piston fixedly mounted in said housing, said main rod comprising a movable cylinder for said piston defining a pair of chambers, a source of pressurized medium for supplying pressurized fluid to said chambers selectively to displace said cylinder to predetermined distances along said longitudinal direction.

4,130,206

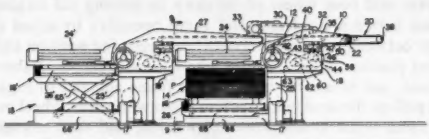
SHEET PILING MACHINE WITH CLASSIFIER AND MULTIPLE PILING ARRANGEMENTS

Velio S. Bucciconе, Portage, Ind., assignor to Bucciconi Engineering Co., Inc., Gary, Ind.

Filed Oct. 4, 1976, Ser. No. 729,131

Int. Cl.[2] B65G *57/11*

U.S. Cl. 214—6 D 12 Claims



1. A machine for piling metal sheets comprising a plurality of unitary sheet accumulating mechanisms arranged in aligned relation, each of said accumulating mechanisms comprising a separate supporting frame having a base portion adapted to be disposed horizontally, a vertically movable platform supported on each said frame for receiving thereon a pile of said sheets, an upstanding portion on each said supporting frame and means thereon cooperating with means on the movable platform for guiding the platform in a vertical path between a raised and lowered position, an infeed conveyor supported on each said upstanding frame portion and extending rearwardly thereof in the direction of sheet travel in cantilever arrangement and at an elevation above the raised position of said platform, means for driving said infeed conveyor to deliver sheets to an area above the associated platform, laterally spaced, elongate sheet edge guide members supported on said upstanding frame portion and extending in cantilever arrangement forwardly thereof above said pile receiving platform, end stop mechanism supported on said side guide members and a cooperating back stop member mounted in spaced relation on said upstanding frame portion, and an overhead conveyor disposed above the discharge end of each said infeed conveyors which is operable to pick up sheets delivered by the infeed conveyor and advance said sheets to the infeed conveyor of the next in line sheet accumulating mechanism.

4,130,207

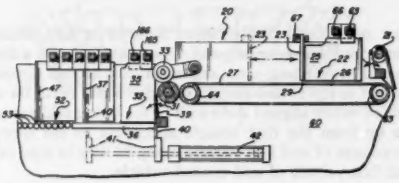
APPARATUS FOR STACKING BOOKLETS FROM THE TOP

John A. Cogswell, Medfield, Mass.; Fred E. Klaszky, Glen Ellyn, and Anthony S. Jacobs, Glencoe, both of Ill., assignors to The Wessel Company, Inc., Chicago, Ill.

Filed Mar. 5, 1976, Ser. No. 664,281

Int. Cl.[2] B65G *57/14*

U.S. Cl. 214—6 D 6 Claims



1. An apparatus for the top stacking of booklets, said apparatus comprising:

means for supporting a stack of booklets;

first conveying means for conveying a stream of unstacked booklets in a downstream direction toward said stack-supporting means;

means for piling booklets from said stream to form a vertical stack atop said stack-supporting means;

means normally actuated to restrain movement of said stack in a downstream direction from said stack-supporting means;

means, responsive to said stack attaining a predetermined size, for deactuating said restraining means, to permit movement of said stack in a downstream direction;

second conveying means downstream of said stack-supporting means;

means for displacing the entirety of said stack as a whole from said supporting means, in a downstream direction, to said second conveying means when said restraining means is deactuated;

second restraining means actuable to restrain movement of the stack in a downstream direction on said second conveying means;

and means for actuating said second restraining means when said first-recited restraining means is deactuated.

4,130,208

SIDE RAILS CONTAINER TRANSFER SYSTEM

Leonard D. Barry, 19300 Pennington Dr., Detroit, Mich. 48221

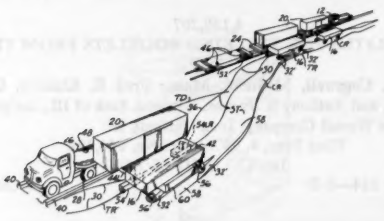
Continuation of Ser. No. 528,948, Dec. 2, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 741,680

Int. Cl.[2] B61D *47/00*; B65G *67/02*

U.S. Cl. 214—43 17 Claims

1. A moving-vehicle bottom-support-way side transfer system comprising a first vehicle way, a first vehicle thereon, a second vehicle way, a second vehicle for transfer between said first vehicle and said second way, (said second vehicle way having means to bear) wheel means for supporting said second vehicle to run on said second way, said wheel means bearing the full weight of the second vehicle below that vehicle, a berth or spot on said first vehicle for said second vehicle to be carried on, first (side-extensible latching) side coupling means on said first vehicle (to engage and couple) for moving said second vehicle in lengthwise alignment with said berth for

transfer, said second way incuding a transfer run along said first vehicle way which includes a coupling run wherealong the ways are spaced a distance apart so said coupling means can reach (when extended) for (to move) moving said second vehicle for transfer and an alignment run wherealong said second way is closer said first way enough to positioning said second vehicle aligned for transfer over said first vehicle, at



least one lateral displacement S-curve in said second way connecting said coupling and alignment runs, and a dip in said second way along said alignment run at the opposite end thereof to lower said second vehicle to said berth on said first vehicle while aligned therewith or for lifting said second vehicle up from the first vehicle according to the direction of movement of said first vehicle along its way to load or unload said first vehicle of said second vehicle.

4,130,209

VEHICLES FOR TAKING ON, TRANSPORTING, AND DISCHARGING A LOAD

Sakari M. Mononen, Salkolantie 3 A 15, 01900 Nurmijarvi, Finland

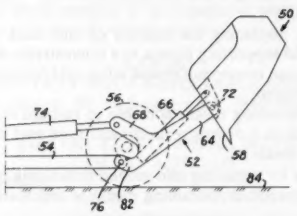
Continuation-in-part of Ser. No. 588,349, Jun. 19, 1975, Pat. No. 3,985,250. This application Oct. 8, 1976, Ser. No. 731,050

Claims priority, application Finland, Jun. 20, 1974, 1909/74; May 14, 1975, 751427

The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.

Int. Cl.[2] E02F *3/28*

U.S. Cl. 214—140 **16 Claims**



1. In a self-loading vehicle which is capable of digging into and/or taking on a load, transporting the load, and then discharging the load, frame means, ground-engaging means supporting said frame means for travelling movement, said ground-engaging means and frame means cooperating with each other for providing the vehicle with a wheelbase of predetermined length, lever means pivotally connected with said frame means for turning movement with respect thereto about a lever axis, load-carrier means pivotally connected to said lever means for turning movement with respect thereto about a carrier axis, lever-displacing means operatively connected between said frame means and said lever means for turning said lever means with respect to said frame means about said lever axis, and carrier-displacing means operatively connected between said lever means and said load-carrier means for turning the latter with respect to said lever means about said carrier axis, both of said displacing means, said lever means, and said load-carrier means cooperating with each other for situating said load-carrier means in a load-receiving position where said load-carrier means is relatively close to the ground and situated beyond said wheelbase, as well as for placing said load-carrier means in a load-transporting position where said load-carrier means is closer to said wheelbase than when said load-carrier means is in said load-receiving position thereof with said load-carrier means when in said load-transporting position thereof being situated sufficiently close to said wheelbase to provide for stable travel of the vehicle with a load carried by said load-carrier means, and for placing said load-carrier means in a load-discharging position where said load-carrier means has been turned about said carrier axis with respect to said lever means while said load-carrier means is situated at an elevation higher then when said load-carrier means is in said load-receiving position thereof, said load-carrier means when in its load-transporting position providing for the load a a center of gravity situated over the wheelbase of the vehicle, and said load-carrier means having a load-carrying capacity on the order of at least 75% of the weight of the vehicle itself, said load-carrier means when in its load-transporting position having a lower wall portion situated directly over said frame means while being adjacent thereto.

4,130,210

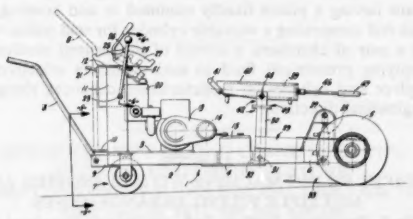
SELF-PROPELLED AIRPLANE DOLLY

John R. Purviance, 3400 Cottage Way, Sacramento, Calif. 95825

Filed Aug. 4, 1977, Ser. No. 821,829

Int. Cl.[2] B60B *29/00*

U.S. Cl. 214—332 **9 Claims**



1. A dolly — for moving, on the ground, a tricycle landing gear-type airplane which includes a nose wheel journaled on a depending strut — comprising a mobile frame, a vertically adjustable ramp at one end of the frame adapted to receive and elevate said nose wheel preparatory to moving the airplane, means between the frame and ramp operative to adjust the latter between a lowered, nose wheel-receiving position and a raised position with said nose wheel thereon disposed above-ground, and means mounted on the frame adapted to engage and pull on the strut in a direction to draw the nose wheel onto the ramp when in said lowered position; said strut engaging and pulling means being mounted in connection and moving with the vertically adjustable ramp.

4,130,211

TRAILER LOADING AND UNLOADING SYSTEM

Jose M. Z. Abascal, Arrieta 3-3°, Pamplona (Navarra), Spain

Filed Jun. 24, 1977, Ser. No. 809,540

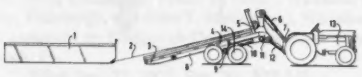
Claims priority, application Spain, Jul. 10, 1976, 449749; Feb. 14, 1977, 226473

Int. Cl.[2] B60P *1/04*

U.S. Cl. 214—505 **7 Claims**

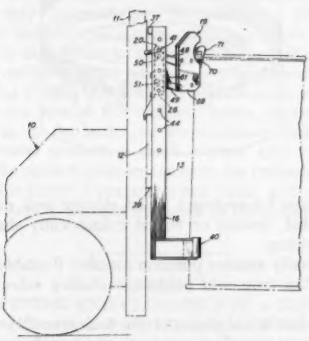
1. In a trailer loading and unloading system for use with a tractor and a trailer, said trailer being of the type having a chassis, said chassis being supported on a set of wheels, said trailer having means for displacing said wheels forward or rearward with respect to the center of gravity of said chassis including any load thereupon whereby said chassis and load are urged by gravity to tilt rearward or forward respectively, the improvement comprising:

(a) a tow head rigidly attached to the front end of said chassis;
(b) a towing structure rigidly attached to the rear end of said tractor;
(c) a rigid tow bar pivotably attached at its first end to a first point on said towing structure and pivotably attached at its second end to a second point on said tow head;
(d) double-acting shock absorber means for retarding motion pivotably attached at its first end to a third point on said towing structure and pivotably attached at its second end to a fourth point on said tow head;
(e) said first and third points being vertically spaced apart, said second and fourth points being vertically spaced apart;



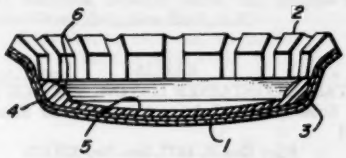
(f) said third and fourth points being higher than said first and second points;
(g) the vertical distance between said second and fourth points being substantially greater than the vertical distance between said first and third points;
(h) said shock absorber means being extensible in the rearward tilting direction of said chassis and being operative to restrain the rate of tilting of said chassis whereby a sudden fall of the rear of said trailer is avoided; and
(i) said shock absorber means having a fixed minimum length, the front of said trailer being supported against said shock absorber means at its minimum length whereby the maximum forward tilt of said trailer is fixed.

4,130,212
MULTIPLE HEAD DRUM LIFT UNIT
Lamberto S. Gatilao, Chicago, Ill., assignor to Liftomatic Material Handling, Inc., Evanston, Ill.
Filed Apr. 26, 1977, Ser. No. 791,040
Int. Cl.[2] B66F 9/18
U.S. Cl. 214—653 **8 Claims**

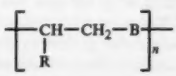


1. For use with a lift rruck having a vertically movable mast for gripping and lifting drums, each having a bead at each end thereof and extending thereabout, a pair of drum gripping attachments each having a lower gripping jaw for gripping beneath the top bead of a drum and an upper gripping jaw cooperating with said lower gripping jaw and gripping within the top bead of a drum, transverse support means adjustably mounting said drum gripping attachments on said mast in laterally spaced relation with respect to each other for movement about a horizontal axis extending between said gripping attachments to conform to a drum having a non-uniform bead and for vertical movement with said mast, and means pivotally mounting said gripping attachments at opposite ends of said transverse support means for movement about parallel vertical axes to conform to the circumferential surfaces of drums of various diameters.

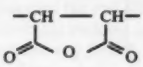
4,130,213
PLASTISOL COMPOSITION AND CONTAINER CLOSURE GASKET MADE THEREFROM
Walter R. Wszolek, Sykesville, Md., assignor to W. R. Grace & Co., New York, N.Y.
Continuation-in-part of Ser. No. 563,018, Mar. 28, 1975, Pat. No. 4,020,966. This application Jan. 10, 1977, Ser. No. 758,233
Int. Cl.[2] B65D 53/06; C08K 5/36; C08L 23/00
U.S. Cl. 215—349 **5 Claims**



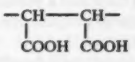
1. A plastisol composition comprising (a) a copolymer resin of a normal α-olefin and maleic anhydride (1:1 mole ratio) having a particle size in the range from about 0.1 to about 1500 microns and having the structure



wherein B is a member of the group consisting of



and

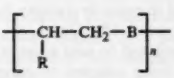


R is H or C_xH_{2x+1}, x is 1 to 16 and n is 2–300, and (b) 65–600 parts/100 parts copolymer of a thiol plasticizer having the formula

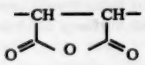
$$R'—(SH)_x$$

wherein x is at least one and R′ is an organic moiety.

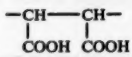
2. A container closure comprising a cap having deposited therein a resinous mass functioning as a gasket to seal the container when the closure is in sealing relationship with the container, said resinous mass comprising a fluxed plastisol of a composition comprising (a) a copolymer resin of a normal α-olefin and maleic anhydride (1:1 mole ratio) having a particle size in the range from about 0.1 to about 1500 microns and having the structure



wherein B is a member of the group consisting of



and



R is H or C_xH_{2x+1}, x is 1 to 16 and n is 2–300, and (b) 65–600 parts/100 parts copolymer of a thiol plasticizer having the formula

$$R'—(SH)_x$$

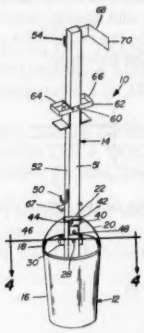
wherein x is at least one and R is an organic moiety.

4,130,214

PORTABLE CONTAINER HAVING SERVICE TOWER

Ted P. Sobson, 22624 Lakecrest St., St. Clair Shores, Mich. 48081

Filed Dec. 8, 1977, Ser. No. 858,621
Int. Cl.[2] B65D *25/00*; A47F *5/00*; A47G *29/00*
U.S. Cl. 220—85 R **1 Claim**



1. An apparatus for storing a cleaning fluid and a plurality of articles and related paraphernalia for use in conjunction with the cleaning fluid, said apparatus comprising:

a container having a bottom and a circular side wall, said container being opened at its top;

an upright support post;

first means carried within the interior of said container at the bottom thereof for supporting the lower end of said support post at a location adjacent to said wall;

second means for fastening said support post to said container wall at the upper portion of said wall;

spacer means associated with said second means between said container and said support post for slightly inclining said support post toward the center of said container for stabilizing said support post when it is carried by said container;

handle means pivotally carried by said container for lifting said container;

third fastening means carried by said support post for snap-lockingly receiving said handle means to secure said container to said support post and to provide stability for said container when said support post is lifted; and

a plurality of holding means mounted to said support post, each of said holding means being adapted to carry and support one of a plurality of said articles and paraphernalia.

4,130,215

NO SPILL BEVERAGE CUP

Joe F. Corey, 11846 Ridgeout, Whittier, Calif. 90601, and Tony G. Corey, 11432 Aldrich, Whittier, Calif. 90606

Filed Feb. 10, 1978, Ser. No. 876,729
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—90.4 **10 Claims**

1. A drinking cup having a substantially reduced tendency to spill or splash, said cup comprising:

a hollow cup having a base, side wall and upper lip; and

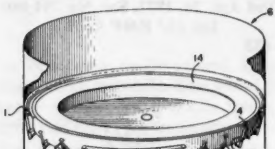
at least two baffle members positioned along the inner surface of the side wall of the cup near the upper lip thereof but positioned downwardly therefrom, each of said baffles being generally annular in shape extending outwardly from the cup wall and having a central opening at least ⅓ the maximum diameter of the inside wall of the cup and each of said baffles having a plurality of passageways passing therethrough.

4,130,216

PERIPHERAL SEAL FOR FLOATING ROOFS

Lou C. Creith, Allentown, Pa., assignor to Altech Industries, Inc., Allentown, Pa.

Filed Apr. 5, 1977, Ser. No. 784,953
Int. Cl.[2] B65D *87/20*
U.S. Cl. 220—224 **13 Claims**



1. Apparatus for sealing a liquid storage tank of the type having welded, riveted or bolted cylindrically shaped sidewalls comprising:

(a) a generally annular pontoon member floatably disposed within the tank, said pontoon including sides, base and top;

(b) a plurality of seal support arms, each pivotally connected to the outer side of said pontoon, said arms being generally vertically disposed, successively and radially about the periphery of said pontoon, the bottom end of each of said arms extending toward the tank bottom and the top end of each arm extending above said liquid;

(c) a plurality of support arm end plates, each mounted on a support arm top;

(d) a plurality of arcuately shaped primary seals attached to successive arm end plates, said seals adapted to sealingly mate with said cylindrically shaped sidewalls;

(e) a plurality of fabric membranes, each membrane extending between and attached to a primary seal and the pontoon, said membranes being disposed between successive radially disposed support arms to form an annular cover;

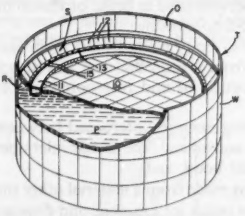
(f) biasing means for biasing said seals radially outwardly to effect a sealing engagement of said seals with said sidewalls;

(g) means flexibly connecting each of said support arm end plates to adjacent successive support arm end plates while allowing limited pivotal movement of each said support arm so that each support arm may, within limits, move inwardly and outwardly toward and away from the tank sidewall to compensate for major irregularities in the tank wall.

4,130,217
SEAL ARRANGEMENT FOR FLOATING ROOF STORAGE TANKS

Richard E. Hills, Coraopolis; Frank R. Neely, Wexford; Derek K. Neely, Pittsburgh, and John T. Malinowski, Hartstown, all of Pa., assignors to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.

Filed Sep. 27, 1977, Ser. No. 837,230
Int. Cl.[2] F16J *15/02;* **B65D** *25/34, 87/36*
U.S. Cl. 220—226 **24 Claims**



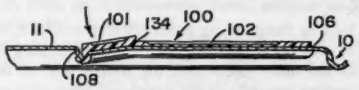
1. A seal arrangement for a floating roof in a storage tank, wherein the roof is spaced at its periphery from the tank side wall, defining an annular rim space, comprising: a plurality of support members each having an inner edge, an outer edge and opposite side edges, and secured at their inner edges to the roof and extending in side-by-side relationship angularly outwardly from the roof into close proximity at their outer edges with the tank side wall, said support members being resiliently yieldable whereby they accommodate themselves to different rim spaces; and resilient means carried by the support members in a position to engage the tank side wall and effect a seal therewith, said resilient means having a predetermined configuration defining at least two different contact areas, such that for minimum rim spaces the resilient means presents a large contact area to the tank, and for maximum rim spaces the resilient means presents a small contact area to the tank, whereby the contact pressure between the resilient means and tank remains below a predetermined value, and wear to the seal is thus kept to a minimum, while an effective seal is maintained.

4,130,218
EASY OPENING END CLOSURE FOR A CONTAINER

John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Continuation of Ser. No. 702,793, Jul. 6, 1976, abandoned, which is a continuation of Ser. No. 643,647, Dec. 23, 1975, Pat. No. 4,004,530, which is a division of Ser. No. 365,014, May 29, 1973, Pat. No. 3,967,749. This application Aug. 15, 1977, Ser. No. 824,998
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—268 **8 Claims**

1. An easy opening end closure for container, said end closure comprising a metal panel, a disc cut from said panel to form a pour opening therein, a plastic tab including a ring seated within said opening, and said disc seated within said ring and stressing said ring in compression between the marginal edge of said opening and the periphery of said disc for sealing said opening, said panel having a flange defining the periphery of the said opening and providing a wide surface seating area

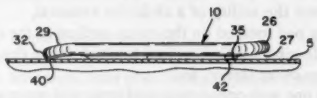


for said ring, said flange terminates in a downward interiorly-facing edge and said ring having a portion curled around said edge and being hooked to said flange.

4,130,219
BEAD SUPPORTED TAB FOR NON-DETACHABLE ENDS

Salvador C. Mallorca, Downers Grove, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,373
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 **7 Claims**

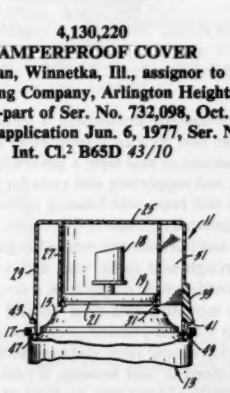


1. A one-piece sheet metal tab suitable for levering open a tear panel on an end wall of an easy open container, said tab having a rear end spaced above the end panel for easy accessibility and adapted to be lifted to open a tear panel and a front end adapted to be pressed down on the tear panel and a hinge member extending substantially lengthwise of the tab between its ends and hingedly connected at one end to said front end of the tab, and having means on the other end for attachment to the end wall, and means at the extreme opposite ends of the tab in constant abutment with the end panel for holding the tab firmly against the end panel upon securement of the tab thereto for preventing rocking movement of the tab about a transverse axis and thereby flexing of the end panel and premature fracturing of the same.

4,130,220
TAMPERPROOF COVER

Robert A. McKirnan, Winnetka, Ill., assignor to Knight Engineering & Molding Company, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 732,098, Oct. 13, 1976, abandoned. This application Jun. 6, 1977, Ser. No. 803,520
Int. Cl.[2] B65D *43/10*
U.S. Cl. 220—284 **6 Claims**



1. A removable and replaceable tamperproof cover for a container having a cylindrical mounting cup with a peripheral undersurface defined by a peripheral outer edge located near the outlet end of the container, said cover including:

a top wall,

a relatively thin flexible outer sleeve depending from said top wall,

a relatively thin flexible inner sleeve generally coaxial with said outer sleeve and also depending from said top wall,

an inwardly projecting locking flange carried by said inner sleeve,

said locking flange being generally trapezoidal in cross section with the longer base of the flange formed integrally with the inner sleeve and the shorter end of the flange extending inwardly of the peripheral outer edge and under the peripheral undersurface of the container mounting cup when the cover is initially installed on the container,

said locking flange and said peripheral outer edge of the container mounting cup being located relative to each other in said installed position of the cover so that at least a portion of the locking flange is removed by said peripheral outer edge when the cover is removed for the first time from the container,

said locking flange being formed and adapted so that the portion thereof remaining after initial removal of the cover provides sufficient engagement with the container mounting cup upon re-installation of the cover on the container that the cover cannot readily be removed by a child but requires squeezing and manipulation ordinarily beyond the ability of a child for removal,

a lifting pad located on the outer surface of the outer sleeve and having a lifting surface located above the lower edge of the outer sleeve, and

at least one web connecting said inner and outer sleeves with said at least one web being located adjacent said lifting pad and forming a connection between the inner and outer sleeves.

4,130,221

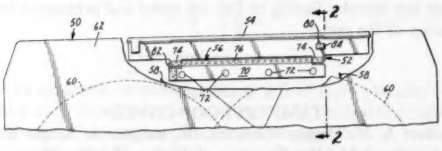
TORSION SPRING DOOR FOR A VIDEOCASSETTE

Clyde V. Peterson, Hutchinson, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 6, 1978, Ser. No. 875,523

Int. Cl.[2] B65D *45/16, 43/14, 51/04*

U.S. Cl. 220—326 **2 Claims**



1. In a videocassette comprising a length of magnetizable recording tape; two reels each supporting a different helically wound end portion of said tape; a generally rectangular housing enclosing and supporting said reels for rotation to transfer tape between said reels, said housing including an outer front wall having generally planar end portions, a recessed portion between said end portions and means for guiding tape between said reels through said outer wall and across said recessed portion to provide a tape access area; a door; a hinge assembly for pivotably mounting said door on said housing for movement between a closed position over said tape access area and an open position spaced from said tape access area comprising a hinge plate fixed to said housing, arcuate generally hollow cylindrical axially aligned side portions of said door and said hinge plate, and a hinge pin extending through said side portions; and a spring for biasing said door to its closed position, the improvement wherein:

said spring is a torsion spring including a straight central portion extending through the side portions of said door and hinge plate to provide said hinge pin, a first end portion fixed to said door, and a second end portion fixed to said housing.

4,130,222

FLUID RESERVOIR

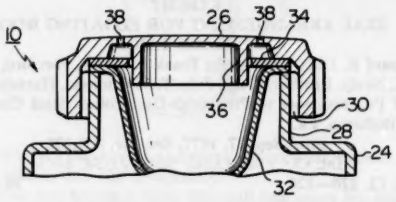
Takayoshi Ono, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 663,344, Mar. 3, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 773,937

Claims priority, application Japan, Mar. 14, 1975, 50-35073[U]

Int. Cl.[2] B65D *51/16*

U.S. Cl. 220—373 **6 Claims**



1. A fluid reservoir used in brake or clutch master cylinders of motor vehicles comprising:

a fluid reservoir body made from a resin material;

a cap made from a resin material and attached to an inlet opening portion of said reservoir body by a thread engagement;

a rubber sealing member interposed between an inside face of said cap and an end face of said inlet opening portion of the reservoir body, and;

a spacer means made from a material other than rubber, such as metals or resins for example, and disposed between said inside face of the cap and said sealing member so that it does not solidly adhere therebetween;

wherein said cap has an annular sleeve extending from the inside face of the cap and at least one air breathing port, which is formed in said cap between said sleeve and the abutting portion between said spacer means and said inside face of the cap.

4,130,223

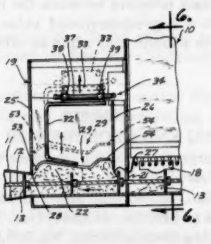
FEED LEVEL MONITOR AND CONTROL APPARATUS

Robert D. Jones, Oskaloosa, Iowa, assignor to Intraco, Inc., Oskaloosa, Iowa

Filed Oct. 8, 1976, Ser. No. 730,931

Int. Cl.[2] B07B *1/28*

U.S. Cl. 222—55 **12 Claims**



1. Apparatus for monitoring and controlling the amount of granular or powdered material delivered to a conveyor system of a type including: a circuitous conveyor tube; a continuous flexible member disposed in said tube and having a plurality of spaced disc members rigidly attached thereto; at least one outlet port in said tube for delivering said material to a predetermined destination; a hopper attached to said tube for holding material for selectively delivering said material to said tube, said hopper having an inlet port connected to one end of

the tube and an outlet port connected to the other end of the tube; the improvement comprising:

means attached to the outlet port of said hopper for sensing the amount of material in the conveyor tube at such outlet port;

means for varying the amount of material passing from the hopper to the conveyor tube; and

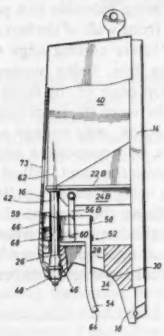
means attached to said sensing means and to said varying means for controlling the amount of material delivered to the conveyor tube from the hopper in response to said sensing means, said sensing means including a housing means for forming a chamber above said flexible member said chamber having an inlet and an outlet orifice for said flexible member, said outlet orifice having an internal diameter larger than said discs but substantially smaller than the internal diameter of said tube whereby a restriction is formed, and said sensing means disposed in said chamber for following the top surface of the material in said chamber.

4,130,224

VISCOUS LIQUID DISPENSER

Richard O. Norman, and John R. Frassanito, both of San Antonio, Tex., assignors to Envair, Inc., San Antonio, Tex.

Filed Oct. 8, 1976, Ser. No. 730,834
Int. Cl.[2] G01F *11/02*
U.S. Cl. 222—185 **1 Claim**



1. Apparatus for dispensing a viscous liquid comprising:

a casing;

a viscous liquid reservoir disposed within said casing;

a resilient tube attached at a first end thereof to said reservoir;

a rigid backup block having a compression surface thereon adjustably disposed within said casing adjacent to said resilient tube, said block being adjustable to regulate the volume of viscous liquid dispensed;

a yieldable dispensing arm pivotally connected at a first end thereof and having a second, free end thereon;

a rigid dispensing block having a tip thereon mounted on said yieldable dispensing arm; said dispensing arm being responsive to an actuating force imposed at said free end thereof to pivotally move to constrict said resilient tube between the tip of said dispensing block and a predetermined impact point on said backup block; said dispensing arm being yieldably responsive to an actuating force to compress a predetermined portion of said resilient tube between said dispensing block and a predetermined portion of said compression surface on said backup block to expell a volume of liquid from within the resilient tube; and

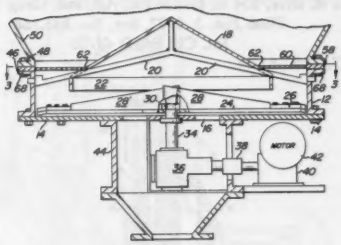
a spring biased, long throw, check valve disposed within said resilient tube at a second end thereof for drawing liquid into said resilient tube in response to the cessation of an actuating force to said lever.

4,130,225

APPARATUS FOR FACILITATING THE REPAIR OF A VOLUMETRIC FEEDER

Charles P. Illes, Jr., Chattanooga, Tenn., assignor to Flowstar Industries, Inc., Passaic, N.J.

Continuation-in-part of Ser. No. 663,321, Mar. 3, 1976, Pat. No. 4,020,980. This application Dec. 7, 1976, Ser. No. 748,334
Int. Cl.[2] G01F *11/20*
U.S. Cl. 222—411 **15 Claims**



1. Feeder apparatus comprising:

(a) a housing, a base plate having means defining a discharge port in said plate, said plate being adjacent the lower end of a vertical wall of said housing,

(b) a cone supported by said housing, said cone having its lower periphery within said housing above the elevation of said port and radially inward of said housing wall,

(c) at least one feeder blade supported within said housing for feeding solids from within said housing to said port,

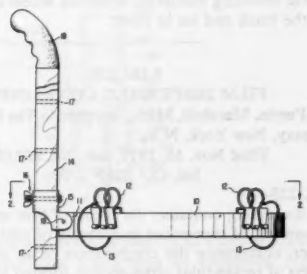
(d) an annular disc removably supported along its outer circumference by the upper end of said vertical wall and along its inner circumference by said cone, said annular disc being divided into at least two sections, whereby said annular disc cooperates with said cone to seal the upper end of said housing, means securing said outer circumference of each disc to said housing, said securing means being readily removable whereby each of said disc sections can be independently secured to and removed from said housing.

4,130,226

GARMENT APPLYING DEVICE

Mary S. Farrell, 5331 Church Dr., Charleston, W. Va. 25306

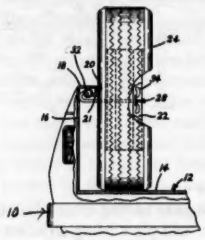
Filed Nov. 4, 1977, Ser. No. 848,566
Int. Cl.[2] A47J *51/06*
U.S. Cl. 223—111 **4 Claims**



1. A garment applying device comprising a hoop-like element to receive a garment to be put on the lower extremities of the body, a plurality of clamps to hold the garment on the hoop-like element, a handle removably attached to a pivotal handle mounting element which is positioned on one side of the hoop, said handle having a plurality of spaced apertures

along its length to adjustably position the handle within the handle mounting element relative to the hoop-like element, means passing through said apertures and said mounting element to secure and adjustably position said handle within said mounting element, and means on the end of the handle to be gripped by the hand of the user.

4,130,227
SPARE WHEEL AND TIRE LOCKING MOUNT FOR PICKUP TRUCKS
Donald R. Rice, 334 E. Butler La., Ashland, Oreg. 97520
Filed Jun. 3, 1977, Ser. No. 803,158
Int. Cl.[2] B62D *43/08*
U.S. Cl. 224—42.24 **2 Claims**



1. A three-piece spare wheel mounting device for use in a pickup truck that has a wide wall surmounted by an inturned flange which continues as a downturned flange, and terminates in an outturned lip to form a sleeve receiving channel, which device includes, in combination,

(a) a hooked member having a terminal hook portion and a straight threaded terminal shank portion, which shank portion is adapted to be passed through a bolt hole of a spare wheel,

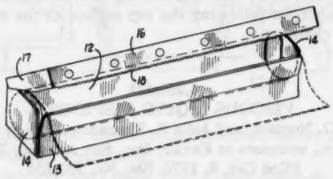
(b) a clamping sleeve which is distinct from the hooked member and which has a side opening capable of receiving the hooked end of the hooked member and of bearing laterally against the outturned terminal lip of the side wall of the truck, and

(c) a wing nut adapted to be threaded onto the straight threaded terminal shank of the hooked member for engagement with the inner face of the wheel,

the construction and arrangement being such that the shank of the hook member can be freely passed completely through the sleeve from end to end and so secured at one end by the wing nut, with the hook protruding outside the sleeve and spaced slightly from it to provide a convenient means for hanging the device from the belt or waistband of the installing mechanic while the wheel is being carried to the truck and set in place.

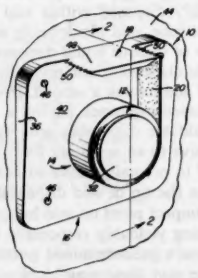
4,130,228
FILM DISPENSING CONTAINER
Ronald Perrin, Marshall, Mich., assignor to The St. Regis Paper Company, New York, N.Y.
Filed Nov. 16, 1977, Ser. No. 852,057
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—19 **7 Claims**

1. A dispensing container for a roll of film and adapted for the dispensing of successive increments of said film from the container, comprising the combination of an elongated cardboard box of rectangular cross-section formed for containing a roll of film, said box having a rear wall, a bottom wall, a front wall, and end walls, said box having a cover portion extending longitudinally of the box hingedly connected to the upper edge of the rear wall of the box, said cover portion at its ends having depending end portions extending downwardly adjacent and outwardly of the upper regions of said end walls, respectively, to overlap the same, said cover along its front edge having a depending front portion extending downwardly adjacent the front wall to overlap the same, said front portion of the cover, when the container is in non-dispensing condition, being tucked within the box behind the front wall of the box and adjacent thereto, said box at the juncture of said front wall and said end walls, respectively, having slits formed therein for permitting said front portion of the cover to be moved to within the box behind the front wall of the box, said front portion of the cover when tucked within the box and the front wall of the box being initially adhered together for holding the box closed during shipping and storage of the box with the roll of film therein, said front portion of the cover being separable from said front wall of the box by overcoming the said initial adherence of the front portion of the cover to the front wall of the box, said front portion of the cover after separation from



the front wall of the box upon swinging of the cover upwardly from the front wall being movable to a position outwardly of, and adjacent to, the front wall of the box, said front portion of the cover having a lower cutting edge extending therealong whereby film in the box, being successively unrolled and threaded over the top edge of the front wall of the box and hence downwardly between the front portion of the cover and the front wall of the box, may engage said cutting edge, the film being severable into successive increments by the film extending from between the front wall of the box and the front portion of the cover being manually pulled downwardly from the box a distance fixing the amount of increment to be dispensed and hence pulled upwardly from the box against the resistance of said cutting edge to tear the film along a line coinciding with said cutting edge to dispense such increment of film from the box.

4,130,229
TAPE DISPENSER
Edillio Pagnini, 301 S. Main St., Hopedale, Mass. 01747
Filed Aug. 26, 1977, Ser. No. 828,292
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—33 **8 Claims**



1. A dispenser for adhesive tape, and the like, comprising, in combination:

(a) spool means for receiving a roll of tape;

(b) mounting means supporting the spool means; and

(c) cutting means provided on the mounting means for severing tape wound from a roll arrangeable on the spool

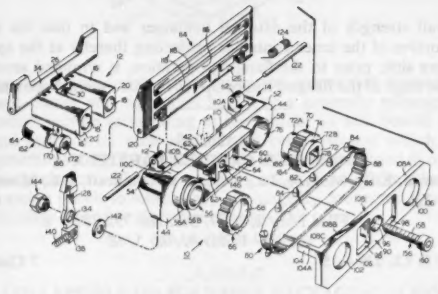
means, the mounting means including a base member having a pair of spaced, planar faces arranged converging toward one another, the cutting means and spool means being disposed on one of the faces, and the faces converging toward one another from the cutting means toward the spool means for making a pull on tape being dispensed slightly away from the plane of the other of the faces.

4,130,230

SHEET FEED TRACTOR

Alan F. Seitz, Harwinton, Conn., assignor to Data Motion Incorporated, Torrington, Conn.

Filed Oct. 31, 1977, Ser. No. 847,234
Int. Cl.² B65H *17/34*
U.S. Cl. 226—75 **17 Claims**



1. A drive tractor for driving web material comprising:
(a) a chassis having means thereon for mounting said chassis in proximity to a drive member;
(b) belt driving means mounted on said chassis and including a drive wheel mounted for rotation on said chassis and adapted to be operatively connected to the associated drive member to be rotated thereby, said drive wheel having a locating element on the periphery thereof;
(c) a flexible endless belt having an outer driving surface and an inner driven surface, said belt driven surface engaging said drive wheel for driving of said belt in a path of travel and including a locating formation thereon dimensioned and configured to mesh with said wheel locating element but not with other segments of said drive wheel periphery, said belt outer surface having a plurality of spaced apart pin members disposed along the length thereof and projecting outwardly therefrom, said pin members being adapted to engage a web material for driving thereof along a portion of said path of travel; said belt locating formation having a predetermined spatial relationship relative to said belt pin members whereby engagement of said belt locating formation with said wheel locating element places said pin members at respective predetermined locations along said path of travel relative to the rotational position of said drive wheel.

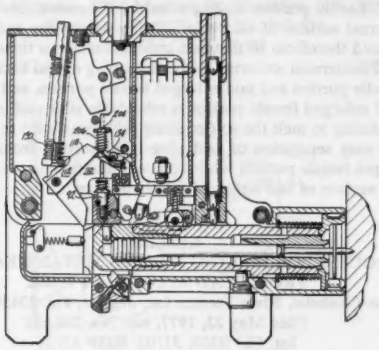
4,130,231

HAMMER BLOCK

Alan Iacoviello, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jun. 15, 1977, Ser. No. 806,785
Int. Cl.² B25C *1/14*
U.S. Cl. 227—10 **3 Claims**

1. A safety device for use with a powder-actuated tool of the type including a housing, a barrel assembly mounted in said housing for reciprocal sliding movement with respect to said housing from a rearwardmost battery position to a forward loading position and return, a firing chamber in said barrel assembly, means carried by said housing forming a magazine adapted to receive and hold a plurality of cartridges, a hammer mounted in said housing, sear means mounted in said housing for releasably engaging said hammer in a cocked position, a trigger bar assembly extending into said housing and having a lower portion thereof engageable with said sear means to disengage the latter from said hammer when said trigger bar assembly is displaced to a firing position, and blocking means for engaging a surface on said barrel assembly to block rearward movement of said barrel assembly toward said battery position upon displacement of said trigger bar assembly to said firing position before said barrel assembly has reached said rearwardmost battery position; the safety device comprising: hammer block means, independent of said sear means, for engaging a surface on said hammer to block substantial displacement thereof from said cocked position before said displacement of said trigger bar assembly to said firing position, thereby preventing accidental impact firing of the tool, said hammer thereby preventing accidental impact firing of the tool, said hammer block means comprising a blocking member moveable between a first position, whereat substantial movement of said hammer from said cocked position is prevented, and a second position, whereat movement of said hammer is unobstructed, said blocking member being operatively connected to said trigger bar assembly whereby movement of the former from said first position to said second position is effected by displacement of the latter to said firing position.

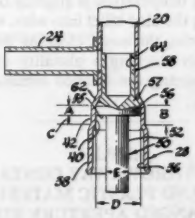


4,130,232

PROCESS PLUG FOR ULTRASONIC SOLDERING

Walter W. Anderson, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1976, Ser. No. 745,578
Int. Cl.² B23K *1/08*
U.S. Cl. 228—57 **2 Claims**



1. For use during immersion soldering of a heat exchanger, a processing combination comprising an aluminum process plug and an aluminum enlarged bell-type female portion having a coatable characteristic for subsequently telescopically receiving a non-aluminum male pretinned tubing portion for completing a permanent joint on the heat exchanger, and wherein the female portion and said process plug cooperate during said immersion soldering because of such coatable characteristic to tin the internal enlarged surface of said female

portion prior to the removal of said process plug and the insertion of said male pretinned tubing portion for completing said permanent joint, said process plug comprising a rod-like member forming a handle portion and a plug head portion, said plug head portion having a longitudinal dimension shorter than said enlarged female portion and a lateral dimension substantially the same as the internal surface of said enlarged female portion so that solder entering said enlarged female portion during said immersion soldering will join said plug head portion to said enlarged female portion along said longitudinal dimension to form a short separable joint therebetween without passing beyond said enlarged female portion into said heat exchanger, said handle portion having a lateral dimension less than the internal surface of said enlarged female portion and thereby spaced therefrom so that said internal surface is tinned during said immersion soldering without forming a joint between said handle portion and said enlarged female portion, and whereby said enlarged female portion is reheatable after said immersion soldering to melt the solder along said short joint to facilitate the easy separation of said plug head portion from said enlarged female portion while retaining the tinning on the internal surface of said enlarged female portion.

4,130,233

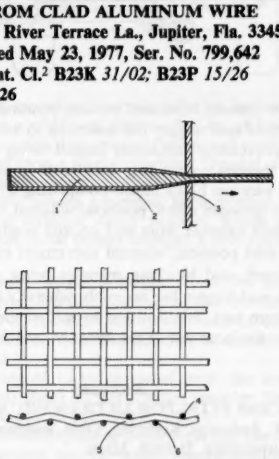
PROCESS FOR MAKING POROUS METAL HEAT SINK FROM CLAD ALUMINUM WIRE

John Chisholm, River Terrace La., Jupiter, Fla. 33458

Filed May 23, 1977, Ser. No. 799,642

Int. Cl.[2] B23K *31/02*; B23P *15/26*

U.S. Cl. 228—126 **7 Claims**



1. The process for making a laminated porous metal panel from clad aluminum wire, said process comprising the steps of encasing a billet of aluminum in a tube of brazable aluminum alloy whose melting temperature is slightly below that of the aluminum, extruding the clad billet into wire, weaving the wire into a mesh, calendering the mesh, cleaning the mesh by vapor degreasing, randomly stacking a plurality of said lamina to form a panel and brazing the stacked lamina in a controlled atmosphere furnace.

4,130,234

COMBINED THROWAWAY CONTAINER OF CARDBOARD AND PLASTIC MATERIAL WITH A RIGIDLY FLANGED APERTURE RIM OR LIP

Werner Schmidt, Hamburg, Fed. Rep. of Germany, assignor to Maschinenfabrik Rissen GmbH, Hamburg, Fed. Rep. of Germany

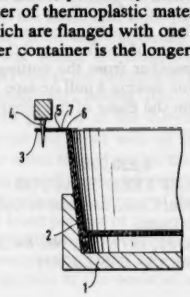
Filed Dec. 27, 1977, Ser. No. 864,399

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1977, 2700230

Int. Cl.[2] B65D *3/04*

U.S. Cl. 229—1.5 B **2 Claims**

1. A combined cup for beverages or packing material that consists of an external container of cardboard or other fibrous material and an inner, preferably bonded or welded-on thin-walled container of thermoplastic material, the two container portions of which are flanged with one another, characterized in that the inner container is the longer by at least double the



wall strength of the external container and in that the rim portion of the inner container projecting thereby at the aperture side, prior to the flanging operation, is wrapped around the edge of the flanged rim or lip (10) of the external container.

4,130,235

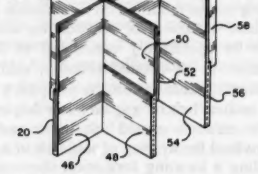
ONE-PIECE CARRIER PARTITION

Earl J. Killy, Monroe, La., assignor to Olinkraft, Inc., Monroe, La.

Filed May 2, 1977, Ser. No. 792,787

Int. Cl.[2] B65D *81/08, 5/48*

U.S. Cl. 229—15 **7 Claims**



1. A one-piece partition for a multiple article carrier comprising

front and back series of panels,

each of said front and back series of panels having at least four panels hinged together at vertical scorelines,

end panels of said front and back series of panels being hinged at horizontal scorelines to the respective end panels of the opposite series of panels,

an adjacent pair of panels in each series of panels between the end panels being free of the corresponding adjacent pair of panels of the opposite series of panels, and

said front and back series of panels having respective alternating tall and short vertical dimensions wherein the corresponding panel of the opposite series to each tall panel is short.

4,130,236

TRAY TYPE CONTAINER

Guelfo A. Manizza, Blauvelt, N.Y., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

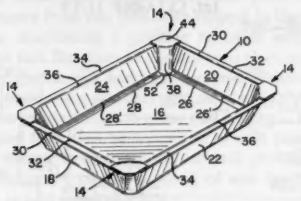
Filed Nov. 28, 1977, Ser. No. 855,245

Int. Cl.[2] B65D *5/24*

U.S. Cl. 229—31 R **6 Claims**

1. A package forming tray adapted for containing a fluid product which tray is formed from a single blank of foldable sheet material having an interior surface providing a leakproof construction, said tray comprising a generally rectangular bottom wall forming panel and upstanding sidewall forming

panels which are connected to each other at their ends by integral corner web formations, said bottom wall forming panel being connected to said sidewall forming panels by relatively narrow sections of material defined by spaced, generally parallel hinge lines which sections of connecting material have an outward curvature in transverse section and each of which, at the ends thereof, terminates at a bowed line defining the bottom edge of the associated corner web formation, said corner web formation including a generally rectangular center section terminating at the bottom on said bowed line and sections on each side of said center section which are generally triangular and which are folded and secured in overlying relation with inner end marginal portions of the sidewall forming panels to which they are hingedly connected thereby forming relatively rigid corner posts.

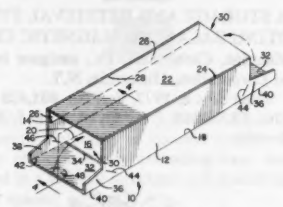


4,130,237

COLLAPSIBLE OR FOLDABLE PACKAGING SLEEVE CONTAINER

Glenn E. Struble, Oxford, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed Jul. 28, 1977, Ser. No. 820,068
Int. Cl.[2] B65D *5/02, 85/02*
U.S. Cl. 229—40 **11 Claims**



1. A collapsible or foldable packaging sleeve-like container of pasteboard material or the like comprising:

(a) a pair of side wall panels;

(b) at least a back wall panel and a front wall panel each of which is foldably connected to one edge each of said side wall panels; and

(c) snap closure means for at least one end of said container including a main flap extending from said at least one end of said back wall panel along a first hinge line and a single distinct auxiliary flap at opposite sides of said main flap, each of said auxiliary flaps being hingedly connected to said main flap along a second hinge line at said opposite sides of said main flap and also hingedly connected to each of said side wall panels along a diagonal hinge extending forwardly from said back wall panel to an adjacent free edge of the respective side wall panel associated therewith;

said closure means being open in the collapsed or folded condition of said container and ready to be closed when said container is initially erected to an upstanding condition to receive an article therein;

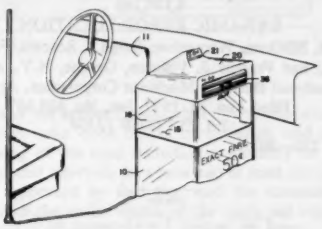
said closure means being closed by rotating said main flap inwardly of said container about said first hinge line on the order of about 90° whereby each of said auxiliary flaps will simultaneously automatically rotate about the respective second hinge line and about the respective diagonal hinge structurally associated therewith in a toggle-like snap locking action to maintain itself in closed condition, each of said auxiliary flaps being hinged outwardly about said second hinge line and folded around its said diagonal hinge to a position of substantially 180° into contact against the adjacent inside surface of one of said side wall panels when said main flap is closed.

4,130,238

FARE BOX

John B. Williams, 825A Madison St., Brooklyn, N.Y. 11221

Filed Oct. 17, 1977, Ser. No. 842,832
Int. Cl.[2] G07B *15/00*
U.S. Cl. 232—7 **2 Claims**



1. A fare collection box fitted with transparent side walls that enclose the sides of an interior collection chamber, so that all the sides of said chamber are transparent, with a cover fitted to said side walls, said cover formed with a first opening in the form of a slot for admittance of coins into the said interior chamber and said cover formed with a second opening of a size to admit an unfolded paper bill of currency,

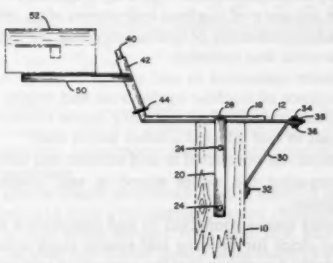
said second opening blocked on the interior of said cover by a pair of engaged rollers, together with motorized drive means to rotate said rollers so as to engage and draw in a paper currency bill through said opening into said chamber.

4,130,239

SWING-AWAY MAILBOX

Rodney W. Belsheim, 607 S. First St., Marshall, Minn. 56258

Filed Sep. 26, 1977, Ser. No. 836,406
Int. Cl.[2] F16M *13/00*
U.S. Cl. 232—39 **3 Claims**



1. Improved roadside mailbox mounting apparatus comprising:

(a) a tubular sleeve having a mailbox support member affixed thereto at a predetermined angle with respect to the axis of said tubular sleeve;

(b) a first cylindrical rod having a smaller diameter than that of said tubular sleeve, said first rod adapted to pass through said sleeve;

(c) a mounting plate affixed to said first cylindrical rod at one end thereof at an angle with respect to the axis of said rod which is the supplementary angle of said predetermined angle;

(d) first and second L-shaped straps having one leg thereof secured to opposite sides of said post and the other leg thereof to said mounting plate; and

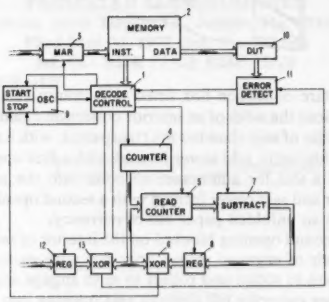
(e) an angle bracket connected at one end to said post and at the other end to said mounting plate,

the connection between said bracket and said mounting plate being adjustable, and said L-shaped straps each having a slotted hole in said other leg thereof.

4,130,240
DYNAMIC ERROR LOCATION

Ernest H. Millham, Warrenton; Ralph J. Scaccia, Fairfax, both of Va., and Francis J. Villante, Greene, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,307
Int. Cl.² G06F *11/04*
U.S. Cl. 235—303.1 **2 Claims**



1. In a digital processor which processes data in response to a sequence of machine instructions issued in response to a system clock and having an error detector which issues an error signal whenever an abnormal operation occurs in the digital processor, a dynamic error location mechanism for identifying the exact machine cycle where an error in the processed data occurs, comprising:

a retry means connected to said error detector for restarting the sequence of machine instructions at an origin lying at a selected number of cycles preceding the cycle at which the error was detected;

a counter connected to said system clock for counting the sequence of machine cycles from said origin;

a register connected to said retry means for storing a value equal to said selected number minus one;

a comparator connected to said counter and said register for comparing the values stored in said counter and said register;

stopping means connected to said comparator and said system clock for stopping said system clock when said comparator determines that the contents of said counter equals the contents of said register;

said retry means setting said register in response to said stopping means, to a value of said selected number minus two (2) if said error detector indicates that the error has occurred, and initiating said system clock at said origin;

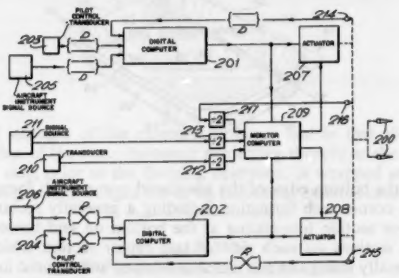
repeating the above steps until said error detector determines that no error has occurred;

whereby the exact machine cycle at which an error actually occurs in a data processing system is determined.

4,130,241
CONTROL SYSTEMS

James F. Meredith, Cheltenham, and Brian Williams, Bishops Cleeve, both of England, assignors to Smiths Industries Limited, Cricklewood, England

Filed Mar. 10, 1977, Ser. No. 776,448
Claims priority, application United Kingdom, Mar. 10, 1976, 9643/76
Int. Cl.² G06F *11/08*
U.S. Cl. 235—307 **9 Claims**

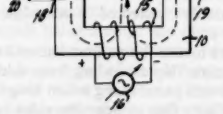


1. In a control system including two control lanes for processing nominally-identical data digitally to derive nominally-equivalent control outputs, and means for comparing said outputs with one another to respond to the existence of a failure, the improvement wherein different digital representations of the same nominally identical data are used in the processing of the same data in the two lanes so that context dependent features (as defined) are detected.

4,130,242
DATA STORAGE AND RETRIEVAL SYSTEM EMPLOYING BALANCED MAGNETIC CIRCUITS

Robert S. Mannion, Carbondale, Pa., assignor to Continental Instrument Corporation, Hicksville, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,428
Int. Cl.² G06K *7/08*; G11B *5/27, 5/20*
U.S. Cl. 235—450 **8 Claims**



1. Apparatus for retrieving information on an information carrying member, said carrying member having at least one magnetic land area located thereon and positioned a predetermined distance from a reference line on said member, comprising:

(a) a magnetic circuit of a "U" shaped configuration having a right vertical arm defining a first pole and a left vertical arm defining a second pole, said first and second arms joined together by the horizontal base member of said "U", said first and second poles separated one from the other by a given distance determined by the length of said bottom horizontal base,

(b) exciting means coupled solely to said base member for

driving said magnetic circuit to provide flux lines between said poles,

(c) first and second windings, with said first winding positioned about said right vertical arm and said second winding positioned about said left vertical arm, balancing means coupled across said windings to determine the amount of flux through one arm as compared to the other,

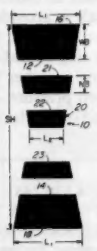
(d) pickup means positioned between said poles and located at a distance from one pole with respect to the other, said distance manifesting a position to cause said means to intercept said flux lines to cause a zero electrical signal to be developed across said means at said position,

(e) means positioning said carrying member in the proximity of said magnetic circuit to cause said magnetic land area to affect said flux lines between one of said poles and said pickup means to provide across said pickup means, a signal indicative of the position of said land area with respect to said reference line.

4,130,243
MACHINE READABLE OPTICAL PRINTED SYMBOL FORMAT

Raymond L. Stevens, 34 Fuller Rd., Cochituate, Mass. 01778

Filed Jul. 5, 1977, Ser. No. 812,711
Int. Cl.[2] G06K *19/04, 7/10*
U.S. Cl. 235—487 10 Claims



1. A machine readable optical printed symbol format for the representation of a plurality of discrete codes comprising:

a plurality of horizontally extending bars, said bars being arranged in a vertical structure and spaced apart by intermediate spaces;

one of said bars serving as the top bar in the vertical structure of said symbol format and a second of said bars serving as the bottom bar in the vertical structure of said symbol format;

said bars being of varying length in the horizontal plane such the length of the center line of said symbol structure is less than the length of the upper edge of said top bar and less than the length of the lower edge of said bottom bar, the bars intermediate to said top bar and bottom bar having proportionally decreasing lengths according to their proximity to the center line of said symbol format, resulting in a generally hour-glass shape for said symbol format;

the height of said symbol format being greater than the length of the upper edge of the top bar and the lower edge of the bottom bar;

some of said bars and spaces being wide bars and spaces, the width being measured in the vertical plane and being less than the length of the upper edge of said top bar;

said wide bars and spaces representing a "one" in a binary code;

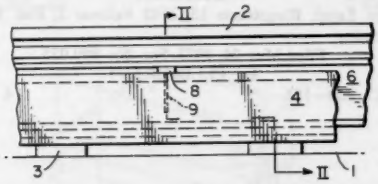
some of said bars and spaces being narrow bars and spaces, the narrow dimension being measured in the vertical plane and being less than the width of said wide bars and spaces;

said narrow bars and spaces representing a "zero" in a binary code.

4,130,244
TRACK RAIL SUPPORT

Manfred Blase, Essen, Germany, assignor to Didier Engineering GmbH, Essen, Germany

Filed Aug. 29, 1975, Ser. No. 609,148
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1974, 2443047
Int. Cl.[2] E01B *3/12*
U.S. Cl. 238—24 11 Claims



1. In a track rail support, particularly for transporting charging cars over coke oven blocks or batteries, said track rail support being of the type including a plurality of ties positioned at spaced intervals on a base and at least one elongated track rail supported by said ties, said ties extending transversely across the entire width of the track rail support, the improvement comprising:

an elongated intermediate carrier positioned between said ties and said track rail, said elongated intermediate carrier extending longitudinally throughout the entire length of said track rail;

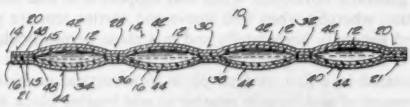
a plurality of secondary track rail supports positioned in contact with said intermediate carrier; and

said secondary track rail supports being spaced from each other in the longitudinal direction of said track rail, each said secondary track rail support being positioned above a position midway between two adjacent of said ties.

4,130,245
LIQUID DISPENSING PACKAGE

John D. Bryson, Milwaukee, Wis., assignor to Will Ross, Inc., Milwaukee, Wis.

Filed Sep. 29, 1977, Ser. No. 837,524
Int. Cl.[2] A61L *9/04*
U.S. Cl. 239—34 12 Claims



1. A package for controllably dispensing into the atmosphere a substance which is normally liquid and vaporizable under atmospheric temperature and pressure conditions, said package comprising

first and second sheets peripherally sealed together in opposing relation to form a hermetically sealed chamber having opposed side walls formed from said first and second sheets, at least one of said sheets being made of a flexible material which is permeable to the liquid substance, and

means joining the interior surfaces of said chamber walls together at a plurality of spaced locations to divide said chamber into a plurality of smaller chambers which are filled with the liquid substance under atmospheric pressure and have wall portions formed from said chamber walls, said wall portions formed from said flexible material collapsing under atmospheric pressure in response to permeation of the liquid substance therethrough to the surrounding atmosphere and having sufficient rigidity to

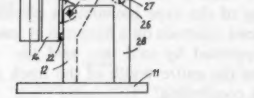
minimize outward bulging thereof by the liquid substance and to encourage surface contact of the entire interior surface of said wall portions with the liquid substance as the liquid substance permeates to the surrounding atmosphere.

4,130,246

APPARATUS FOR THE EXTRACTION OF DIE-CAST PARTS FROM THE MOLDS OF DIE-CASTING MACHINES

Werner Engel, Ringstrasse 13, 3502 Vellmar 2, Fed. Rep. of Germany

Filed May 24, 1977, Ser. No. 800,035
Int. Cl.[2] B05B *3/18*
U.S. Cl. 239—186 **4 Claims**



1. An extracting apparatus for extracting hot die-cast parts from the casting mold halves of a die-casting machine, said apparatus comprising: a bearing block adapted to be positioned adjacent a die-casting machine, a sleeve, a carrier arm supported by said sleeve for axial sliding movement relative thereto along a slide axis running longitudinally of said arm, a gripping device mounted on said carrier arm for gripping work pieces from the mold halves of the die-casting machine with which it is associated and for removing such work pieces to a delivery station as a result of movement of said carrier arm, a support between said bearing block and said sleeve, means pivotally connecting said support to said bearing block for movement of said support relative to said bearing block between first and second positions approximately 90° from one another and about a horizontal first pivot axis, means pivotally connecting said sleeve to said support for movement of said sleeve relative to said support about a second pivot axis which is generally vertical when said support is in said first position and generally horizontal when said support is in said second position whereby when said sleeve and carrier arm are positioned generally horizontally and in a plane perpendicular to said horizontal first pivot axis said sleeve and carrier arm may be rotated in a first vertical plane to a vertical position by movement of said support relative to said bearing block about said horizontal first pivot axis and may then be rotated in a second vertical plane perpendicular to said first vertical plane to a new horizontal position by movement of said sleeve relative to said support about said second pivot axis.

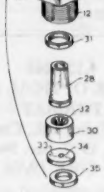
4,130,247

SPRAY NOZZLE

Mark Healy, Orlando, Fla., assignor to Senninger Irrigation, Inc., Orlando, Fla.

Filed Dec. 17, 1976, Ser. No. 751,900
Int. Cl.[2] B05B *1/26, 1/30*
U.S. Cl. 239—523 **10 Claims**

1. A spray nozzle comprising in combination:
a threaded base for attachment to a water line, and having an opening therethrough and a plurality of bores therein;
a removable nozzle insert mounted in said opening through said base with a retainer ring and having an opening therethrough of a predetermined size, and an exterior of predetermined size and shape for fitting into the opening through the threaded base;
a removably mounted water-deflector member, having a curved water deflecting surface and having attaching means for attaching said water-deflector to said base, said attaching means having at least one insert attached to said water-deflector member and protruding into one of said



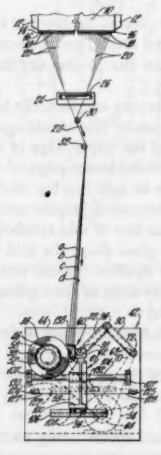
plurality of bores in said threaded base, whereby an easily assembled spray nozzle is provided; and
a flow control member mounted adjacent said removable nozzle insert retainer ring in said opening in said threaded base, said flow control member being a flexible member which under increased pressure is flexed into said nozzle insert retainer ring to reduce the passageway through said retainer ring.

4,130,248

METHOD AND APPARATUS FOR PACKAGING MULTISTRAND ROVING

Ronald W. Hendrix, Columbus; Jerome P. Klink, Granville, and John W. Dunn, Sylvania, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 20, 1977, Ser. No. 799,059
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—18 G **14 Claims**



1. The method of packaging a roving comprising a plurality of strands of glass fibers including segregating a linear group of the fibers into a plurality of strands, winding the strands of the

roving into a package on a rotating mandrel, advancing the strands in separated relation toward the package in a plane substantially normal to the axis of rotation of the package, traversing the strands lengthwise of the package while maintaining the strands adjacent the package in a plane substantially normal to the axis of rotation of the package, and engaging the strands successively with the package surface at peripherally-spaced regions whereby the strands of the roving are collected in side-by-side relation on the package.

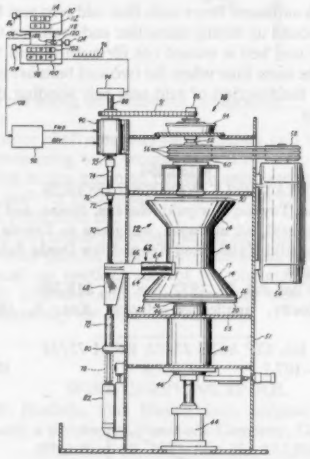
7. Apparatus for packaging a roving comprising a pluralit of strands of glass fibers including, in combination, a winding machine having a rotatable mandrel upon which the roving is wound, means spacing the strands one from another as they as advanced toward the package, and means for traversing the strands lengthwise of the package, said traversing means maintaining the spaced strands substantially in a plane normal to the axis of the mandrel whereby the individual strands of the roving successively engage peripherally-spaced surface regions of the package.

4,130,249

WIRE SPOOLER

Wilhelm A. Steinhilber, Guilford, Conn., assignor to Orion Machinery & Engineering Corp., Branford, Conn.

Filed Dec. 1, 1977, Ser. No. 856,799
Int. Cl.[2] B65H *54/12, 54/32*
U.S. Cl. 242—25 R **20 Claims**



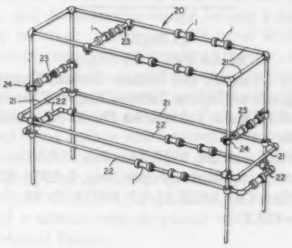
1. An apparatus for winding wire onto spools, said apparatus comprising: means for rotating a spool such as aforesaid about its central axis, a traversing guide for guiding wire onto the spool rotated by said rotating means, means supporting said traversing guide for traversing movement relative to said spool back and forth along a path parallel to said central spool axis, means for moving said traversing guide along said path at a speed related to the rotational speed of said spool by a fixed speed ratio, and means for reversing the direction of said traversing guide along said path when said traversing guide reaches either one of two end limits spaced from one another along said path and between which said traversing guide moves, said reversing means including a pulse generator connected to said spool rotating means and an associated pulse counter for providing pulse counts representative of amounts of rotation of said spool, means for effecting reversal of said traversing guide when the pulse count of said counter reaches a predetermined number and means responsive to the pulse counts provided by said pulse counter for increasing said predetermined number and for thereby increasing the spacing between said two end limits as the total rotation of said spool increases during the winding of wire onto it.

4,130,250

REELS FOR MEDICAL TRACTION APPLICATIONS

Mervyn Evans, Oxford, and John D. Harris, Abingdon, both of England, assignors to The Secretary of State for Social Services in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 19, 1977, Ser. No. 834,356
Claims priority, application United Kingdom, Sep. 24, 1976, 39884/76
Int. Cl.[2] B65H *17/02;* A61H *1/02*
U.S. Cl. 242—68 **7 Claims**



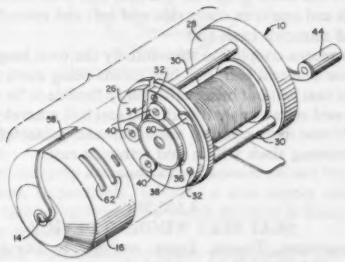
1. A reel for applying traction, restraint, or support to a patient, comprising a spool, a close wound helical spring which is coaxially attached to the spool by one of its ends, and an end cap operatively connected to the other end of said spring; whereby in use the spool, spring, and end cap are mounted on a cylindrical support having a slightly greater diameter than the free internal diameter of the spring so that the spring encircles and grips the support, rotation of the spool in one direction expanding the spring to free its grip and contra-rotation of the spool being resisted by the grip of the spring while rotation of the end cap in the contra-rotation direction expands the spring to release its grip and permit said contra-rotation of said spool.

4,130,251

COMBINATION TROLLING AND CASTING REEL

Jack R. Findley, 5921 Cherrywood Ter., Greenbelt, Md. 20770

Continuation-in-part of Ser. No. 806,691, Jun. 15, 1977, abandoned. This application Apr. 11, 1978, Ser. No. 889,034
Int. Cl.[2] A01K *89/015, 89/01*
U.S. Cl. 242—84.2 C **9 Claims**



1. A fishing reel adapted to be shifted between casting and trolling modes comprising:

a housing, a spool adapted for rotation about an axis relative to the housing, the spool including a line portion around which fishing line can be wound, rotating means for rotating the spool, first bearing means for rotatably mounting the spool on the housing on one side of the line portion, the spool on the other side of the line portion being spaced from the housing at a distance at least wide enough to accommodate a strand of fishing line, the first bearing

means including means for accommodating movement of the spool between its normal axial position to a second position where a portion of the spool on the other side of the line portion will engage the housing when pressure is exerted on the spool and return to said normal position when the pressure is relieved, the housing including an opening therein located to allow the fishing line to be shifted between the trolling mode whereby line projects from the spool generally perpendicular to the spool axis and the casting mode whereby the line can unwind generally axially from the spool through the space between said other side of the line portion and the housing when the spool is in its normal axial position.

4,130,252

SEAT BELT SYSTEM

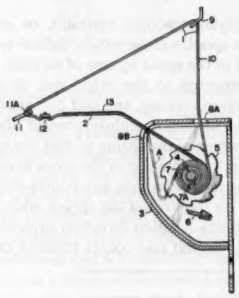
Mamoru Mori, Okazaki, and Mitsuo Inukai, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, both of Aichi, Japan

Filed Jul. 25, 1977, Ser. No. 818,301

Claims priority, application Japan, Aug. 2, 1976, 51103420[U]

Int. Cl.[2] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.1 **8 Claims**



1. A seat belt retractor system for retracting two seat belts into a single retractor, comprising:

a retractor case;

a base provided within said retractor case;

a retractor shaft rotatably supported by said base;

two seat belts coupled to said retractor shaft and wound one over the other such that one seat belt is an inner side seat belt and one is an outer side seat belt and extendable from said retractor case; and

a bias means coupled to substantially the total length of said inner side seat belt, said bias means being more rigid than said seat belt but being sufficiently flexible to be wound up on said retractor shaft with said seat belt whereby said seat belt can be smoothly extended and retracted without becoming slack within said retractor case.

4,130,253

SEAT BELT WINDING DEVICE

Jun Yasumatsu, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 25, 1977, Ser. No. 818,409

Claims priority, application Japan, Oct. 14, 1976, 51-137917[U]

Int. Cl.[2] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.1 **15 Claims**

1. A seat belt winding device for use in a three point seat belt system comprising:

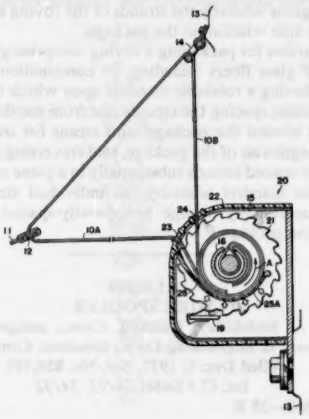
two seat belts for use as a lap belt and as a shoulder belt;

a base;

a shaft rotatably supported by said base for winding up said seat belts;

a housing covering said base, shaft and wound up portion of said seat belts; and

a means for preventing slack of the belts within the housing comprising an arm integral with and extending from said housing pressing against the wound up portion of said seat



belts with sufficient force such that said two seat belts are tightly wound up during retraction and such that the same length of seat belt is wound out for both of said two seat belts at the same time when the two seat belts are extended whereby malfunction of said seat belt winding device is prevented.

4,130,254

SEAT BELT WINDING DEVICE

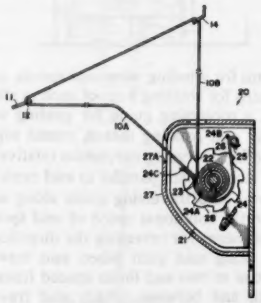
Jun Yasumatsu, Toyota; Noriyuki Masuda, Joetsu, and Tatsushi Kubota, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Tokai Rika Denki Seisakusho, both of, Japan

Filed Jul. 25, 1977, Ser. No. 818,300

Claims priority, application Japan, Aug. 6, 1976, 51-105011[U]

Int. Cl.[2] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.1 **10 Claims**



1. A seatbelt winding device for motor vehicles comprising:

a pair of seatbelts;

a base;

a shaft rotatably supported by said base for winding up said pair of seatbelts; and

a pressure board coupled to said base and resiliently engaging with and substantially surrounding the outside surface of said seatbelts wound up on said shaft for preventing slack in said seatbelts, whereby a pressure is applied to

said seatbelts along said shaft and both of said seatbelts will extend together the same length when unwound.

4,130,255

PASSENGER RESTRAINING BELT RETRACTOR

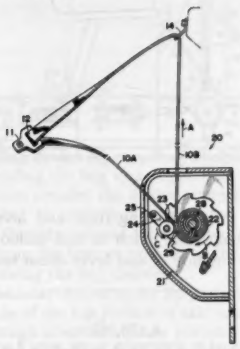
Shiro Sasaki; Jun Yasumatsu, both of Toyota, and Kazuhisa Tatematsu, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 22, 1977, Ser. No. 818,140

Claims priority, application Japan, Jul. 30, 1976, 51-102541[U]

Int. Cl.² A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.1 **5 Claims**



1. A restraining belt retractor comprising:
a base;
a retractor shaft rotatably supported by said base;
two restraining belts secured to said retractor shaft;
first bias means mounted between said base and said retractor shaft for biasing said retractor shaft in the direction of belt retraction; and
second bias means resiliently engaging with and pressing an unrolled portion of said two restraining belts against the wound up portions thereof for preventing slack in the belts whereby said two restraining belts are extended substantially the same amount.

4,130,256

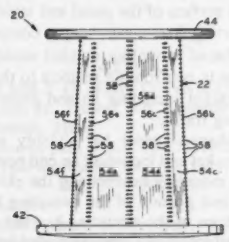
WIRE CARRYING SPOOL

Hugh W. Hosbein, Fort Wayne, Ind., assignor to Mossberg Hubbard, a division of Wanskuck Company, Garrett, Ind.

Filed Nov. 18, 1977, Ser. No. 852,865

Int. Cl.² B65H *75/14*

U.S. Cl. 242—118.4 **1 Claim**



1. A wire carrying spool comprising a barrel having a barrel axis;
said barrel being frusto-pyramidal having wire receiving barrel sides inclined from one spool end to the other;
said barrel having corners formed between adjacent side edges;
said corners each having a plurality of axially spaced ridges formed thereon to define wire receiving channels whereby wire windings will nest in said channels for maintaining axial wire placement;
said ridges of circumferentially adjacent corners being axially displaced thereby defining helically disposed wire receiving grooves on said barrel corners;
said barrel having an integral flange on one end, a demountable flange on the other end of said barrel, said demountable flange being removably secured to said barrel by means of threaded fasteners;
said other end of said barrel being formed with an annular recess having a cylindrical wall portion of smaller diameter than the outer dimension of said barrel and a radial ledge, said demountable flange having a central opening snugly received over said cylindrical wall portion and supportably engaged with said radial ledge, and a plurality of circumferentially spaced fasteners extending axially of said barrel passing through said demountable flange and removably fastenable to said barrel; and
said spool being hollow and internally tapered outwardly at said one end, and including a plate-like insert having an outer periphery conforming to said tapered portion and press-fitted therein to a position at which one surface thereof is substantially co-planar with the end surface of said integral flange.

4,130,257

TAPE DRIVE MECHANISM

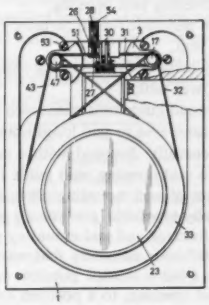
Gerhard Falk, Rossdorf, Germany, assignor to Robert Bosch GmbH, Darmstadt, Germany

Filed Mar. 18, 1977, Ser. No. 778,924

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611638

Int. Cl.² G11B *15/22*

U.S. Cl. 242—193 **2 Claims**



1. A tape transport mechanism comprising in combination:
a frame,
a pair of coaxially arranged hubs disposed on said frame, and adapted, respectively, to carry a tape supply reel and a tape take-up reel between which the tape is transportable under tension,
electrically operable drive means comprising a pair of motors for selectively rotating said hubs in first and second opposite directions, each motor having a shaft in driving connection with a respective hub,
a plurality of supports disposed on said frame,
braking means including a plurality of hairpin springs in contact with, and surrounding a respective shaft, and yieldably resilient means urging said hairpin springs to act on the respective shaft to constrain the same against relative turning of the corresponding hub drivingly connected thereto, in a sense allowing the tape to slacken, each hairpin spring having a free extremity and an extremity restrained by a respective support, and

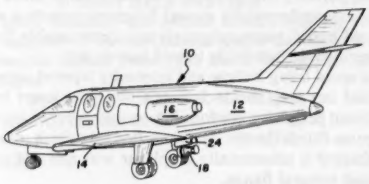
operating means including an electromagnet having a movable armature, said movable armature having a portion engageable with said free extremities so as to release said hairpin springs from contact with the respective shaft, and to terminate the action of said braking means.

4,130,258

AIRCRAFT WITH RETRACTABLE AUXILIARY POWER UNIT

Anthony Fox, 8306 Queen Ave. South, Minneapolis, Minn. 55431

Filed Nov. 17, 1977, Ser. No. 852,216
Int. Cl.[2] B64D *41/00*
U.S. Cl. 244—58 **1 Claim**



1. In a heavier than air aircraft of the type having an airframe including a fuselage supporting first and second wing members along the longitudinal axis of said fuselage and having first and second main power units disposed on opposite sides of said fuselage and generally above the longitudinal axis of said wing members, the improvement comprising:

(a) an opening formed in the bottom of said fuselage said opening being located symmetrically about a line parallel to said longitudinal axis of said fuselage;

(b) first and second door members shaped to conform to the surface of said fuselage in the area of said opening for normally covering said opening;

(c) a hydrogen peroxide fueled thruster rocket engine auxiliary power unit;

(d) a generally rectangular mounting plate connected to said auxiliary power unit;

(e) first and second guide rails connected to said fuselage and extending transverse to said longitudinal axis of said fuselage and generally disposed within said fuselage and in proximity to said opening, said guide rails slidably engaging the edges of said mounting plate; and

(f) hydraulically operable positioning means coupled between said fuselage and said mounting plate for selectively opening said door members and moving said auxiliary power unit from a normal position within said fuselage through said opening, to a position exterior to said fuselage and below the longitudinal axis of said first and second wing members prior to energization of said auxiliary power unit.

4,130,259

HELICOPTER COLLECTIVE LEVER

Floyd W. Carlson, Fort Worth, and Joseph Mashman, Dallas, both of Tex., assignors to Textron Inc., Providence, R.I.

Filed Aug. 10, 1977, Ser. No. 823,284
Int. Cl.[2] B64C *27/56*
U.S. Cl. 244—83 F **5 Claims**

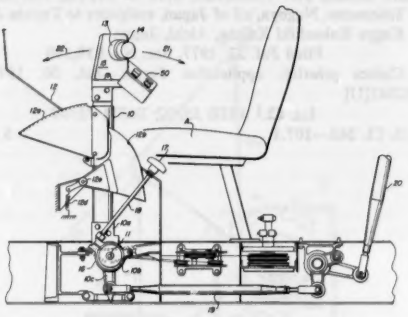
1. In a helicopter collective pitch and control for the helicopter engine system control, the combination which comprises:

(a) structure in a helicopter adjacent a pilot seat forming a horizontal pivot at about the cabin floor adjacent to and ahead of the pilot seat and having an axis lateral relative to the longitudinal axis of said helicopter,

(b) a control lever mounted on said pivot normal to the longitudinal axis of said helicopter,

(c) a throttle support extending generally parallel to said pivot away from said seat,

(d) throttle means including at least one control on said support coupled through said lever to control the engine system, and



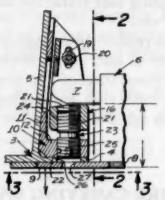
(e) a control train extending from said lever to vary the collective main rotor pitch of said helicopter in dependence upon rotation of said lever about said pivot.

4,130,260

ADJUSTABLE KEEPER FOR PIN LATCHES

L. Richard Poe, Long Beach, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Aug. 26, 1977, Ser. No. 828,030
Int. Cl.[2] B64C *1/14*
U.S. Cl. 244—129.5 **2 Claims**



1. An adjustable keeper for a pin latch carried by an aircraft panel, the margins of which overlap a supporting frame to dispose the panel flush with the surrounding surface of the aircraft, the pin latch being movable between a retracted position and an extended position in essentially parallel relation with the adjacent surface of the panel and in confronting relation to the supporting frame, said keeper comprising:

a. a channel shaped mounting bracket secured to the supporting frame in confronting relation to the pin latch, the mounting bracket including an end portion confronting the supporting frame;

b. a channel shaped keeper bar slidably received in the mounting bracket and including an end portion interposed between the mounting bracket and the pin latch and confronting the end portion of the mounting bracket;

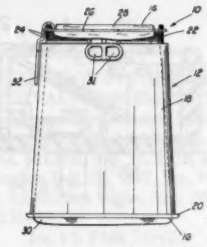
c. the end portions of the mounting bracket and keeper bar having coaxial internally screwthreaded bores of opposite pitch;

d. and a screw means having opposed screwthreaded portions received in the screwthreaded bore, the screw means having a tool socket, the supporting frame being perforated for access to a tool inserted in the socket, for applying a force against the pin latch in a direction to urge the panel into firm contact with the supporting frame.

4,130,261
BAG FILLING DEVICE

Ray A. Dow, 804 N. Ross, Dewey, Okla. 74029

Filed Apr. 11, 1977, Ser. No. 786,063
Int. Cl.[2] A63B *55/04*
U.S. Cl. 248—97 2 Claims



1. A bag filling device for receiving a bag or the like therein, the device holding the bag in an open position for filling the bag with various articles, the device comprising:

a tube having an open top portion and an open bottom portion, the sides of said tube tapered upwardly and inwardly from the bottom portion to the top portion, said tube receiving the bag therein;

a recessed annular shaped upper lip portion disposed around the outside of the top portion of said tube, said lip portion having rough textured surface portions for engaging the edges of the open top of the bag when the top of the bag is overlapped against the surface of said lip portion;

a pair of sets of outwardly extending protuberances disposed on opposite sides of the surface of said lip portion and intermediate the rough textured surface portions;

a pair of semicircular handles having a first end portion, a second end portion, and a "U" shaped center portion, said handles parallel to each other when raised into a vertical position, the first end portion and the second end portion of said handles pivotally attached to the top of said lip portion, said handles when pivoted into a horizontal position adjacent the sides of said lip portion compressing the top of the bag against the textured surface of said lip portion, the "U" shaped center portion of said handles engaging said protuberances in a snap fit;

a hook pivotally mounted on said lip portion between the second end portions of said handles; and

a plurality of notches disposed in the top of said lip portion and adjacent the first and second end portions of said handles, said notches receiving a portion of the top of the bag when the bag is overlapped on the surface of said lip portion, said notches allowing the bag to be wrapped around the surface of the upper lip portion without contacting said hook and the first and second end portions of said handles.

4,130,262
ADJUSTABLY INTERFITTING PANEL CLAMP

John Steckowich, Jr., Edison, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 729,452, Oct. 4, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,192
Int. Cl.[2] F16B *1/04*
U.S. Cl. 248—226.1 12 Claims

1. An adjustable clamp comprising:

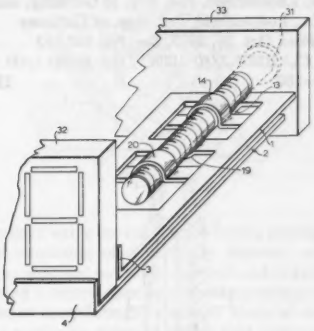
A. a first clamping jaw and a second clamping jaw;

B. a first extension means connected to said first clamping jaw and a second extension means connected to said second clamping jaw, said first and second extension means being adapted to be placed in overlying relationship to hold said first and second clamping jaws in an adustably opposing relationship;

said first and second clamping jaws and said first and second extension means forming respective first and second L-shaped members;

C. mutual interfit means, formed in each of said first and second extension means, for enabling both said extension means to be mutually and slide-adjustably interfitted when said means are placed in the overlying relationship, and for forming an anchor receiving means between said overlying extension means;

said mutual interfit means comprising apertures and semicylindrical bands formed in each of said first and second extension means;



the semicylindrical bands of said first extension means being non-threaded and the semicylindrical bands of said second extension means having threads formed therein; at least one of said bands in each of said extension means being received in one of said apertures of the other extension means; and

D. controllable anchor means, adapted to pass into said anchor receiving means, for securing said overlying extension means together and for producing a controlled sliding of said second extension means with respect to said first extension means, said controlled sliding effecting an adjustable clamping action between said opposing first and second clamping jaws.

4,130,263
CHAIRS

Hans Roericht, Ulm, Fed. Rep. of Germany, assignor to Wilkhahn, Wilkening & Hahne, Eimbeckhausen, Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,664
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—371 7 Claims

1. A seat comprising

a seat portion,

a stem carrying the seat portion, and

a base supporting the stem, the base including

a support,

a ground-engaging flexible bag secured to the support and, together with the support, defining a chamber, and particulate material substantially filling the support and flowable in the bag to change the shape of the bag in response to displacement of the bag produced by a tilting of the stem whereby to hold the seat in equilibrium in its tilted state.

4,130,264

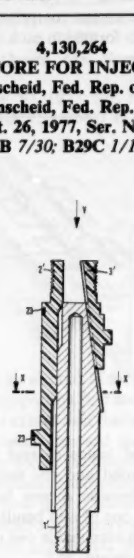
EXPANDABLE CORE FOR INJECTION MOLDING

Peter Schröer, Ludenscheid, Fed. Rep. of Germany, assignor to Geyer & Co., Ludenscheid, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,613

Int. Cl.[2] B28B *7/30*; B29C *1/12*; B29D *1/00*

U.S. Cl. 249—180 **12 Claims**



1. In an expandable core device for forming an interior wall in a part being molded and including a core pin and a sleeve composed of a plurality of segments disposed around the pin, the segments being movable axially of the pin and radially inwardly from a molding position to an unmolding position, the improvement wherein: said pin is provided with a conical outer surface defined by a plurality of faces disposed around the periphery of said pin and each having a continuous slope toward the axis of said pin in the direction of axial movement toward the unmolding position; said sleeve is constituted by a group of first lateral slides and a group of second lateral slides, each said slide constituting a respective segment which extends axially of said pin and is movable along a respective face of said outer surface, said first slides alternating with said second slides around the periphery of said pin, and each said slide having a continuously sloping inner surface arranged to cooperate with its associated face; and said conical outer surface faces and said inner surfaces of said slides are formed such that the angle of inclination of said inner surfaces of said second slides and of said pin faces associated therewith, relative to the axis of said pin, is approximately twice that of said inner surfaces of said first slides and of said pin faces associated therewith.

4,130,265

ELECTRICALLY OPERATED SWITCHING VALVE

Naoji Sakakibara, Chiryu, and Nobuyuki Hashimoto, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

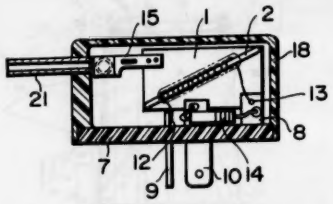
Filed Feb. 3, 1977, Ser. No. 765,309

Claims priority, application Japan, Feb. 25, 1976, 51-22039

Int. Cl.[2] F16K *31/04*

U.S. Cl. 251—11 **7 Claims**

1. Electrically operated switching valve comprising valve housing means provided with valve port means, valve member means for co-operation with valve seat means formed on said valve port means, valve actuating means for moving said valve member means into and out of engagement with said valve seat means, said valve actuating means including resilient plate means supported on said valve housing means and carrying said valve member means, strap means having opposite ends rigidly secured to the resilient plate means at two spaced apart portions and having a dimension smaller than the distance



between said portions under a normal condition so that the plate means is deflected from a normal position, electric heating wire means for heating the strap means when energized, and means for energizing the heating wire means so as to generate heat in the heating wire means for producing thermal expansion of the strap means to allow the resilient plate means to return to its normal undeflected position.

4,130,266

PRESSURE CONTROL VALVE

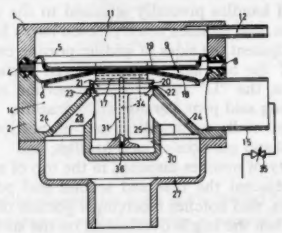
Johannes-Gerhard Bertling, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,332

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625512

Int. Cl.[2] F16K *31/12*

U.S. Cl. 251—50 **9 Claims**



1. A pressure control valve including a housing and non-resilient flexible diaphragm means in said housing dividing the interior volume thereof into a first chamber and a second chamber, and said housing including a valve seat disposed in said second chamber and a valve closing member attached to said diaphragm means to cooperate with said valve seat to control communication between said second chamber and interior portions of said housing downstream of said valve seat and wherein the improvement comprises:

said diaphragm means is composed of two substantially adjoining diaphragms fastened together at their centers and fastened to said valve closing member and moving therewith, said housing being provided with wall channel means for admitting pressurized fluid to the space between said two diaphragms; and

a relief piston, attached to said valve closing member and extending beyond said valve seat and disposed to glide sealingly in a blind bore of said housing having a diameter equal to said valve seat to thereby define a variable space which communicates with said second chamber via a conduit in said relief piston;

whereby, when pressurized fluid is admitted to said first chamber, the excursions of said diaphragm means variably open said valve seat to thereby control the pressure in said second chamber.

4,130,267

PNEUMATIC CONTROL SYSTEM AND PRESSURE RESPONSIVE VALVE ASSEMBLY THEREFOR

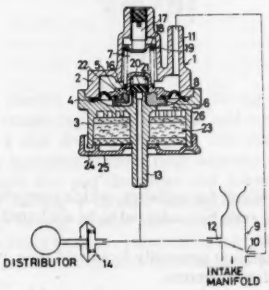
Masami Inada, and Kazuhiko Kitamura, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Division of Ser. No. 611,960, Sep. 10, 1975, Pat. No. 4,044,732. This application Feb. 25, 1977, Ser. No. 772,201

Claims priority, application Japan, Sep. 20, 1974, 49-108971; Nov. 7, 1974, 49-128403

Int. Cl. F16k *31/128*

U.S. Cl. 251—61.2 6 Claims



1. A pressure responsive valve assembly for use with a vacuum source, comprising in combination:

a housing including an inlet port adapted to be connected to said vacuum source and an outlet port adapted to be connected to an engine emission control device of a motor vehicle,

said housing being comprised of an upper housing and a lower housing,

a diaphragm secured between the edges of said upper and lower housing dividing the interior of said housing into a first chamber and a second chamber, said first chamber adapted to be communicable with said vacuum source through said inlet port, while said second chamber is provided with a hole communicating with air at atmospheric pressure,

a power piston movably disposed in said housing,

a guide member secured to said power piston with the inner peripheral edge of said diaphragm secured between said piston and said guide member,

a first spring disposed within said housing for urging said power piston to move in one direction into said second chamber,

said power piston being movable in the other direction against the force of said first spring when a vacuum is applied to said first chamber, a valve seat surrounding said outlet port,

a valve member operatively associated with said power piston and cooperative with said valve seat to control the admission of atmospheric air to said outlet port from said second chamber, and

a second spring disposed between said power piston and said valve member and being weaker than said first spring for urging said valve member to rest on said valve seat when said power piston is being urged in said one direction.

4,130,268

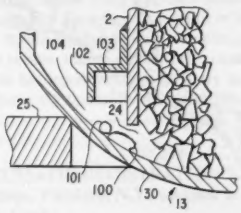
ROTARY VALVE FOR POWDERY AND GRANULAR MATERIALS

Kenji Kojima, and Tatsunori Saigusa, both of Tokyo, Japan, assignors to Hitachi Plant Engineering & Construction, Tokyo, Japan

Continuation-in-part of Ser. No. 608,384, Aug. 27, 1975, abandoned. This application Apr. 7, 1977, Ser. No. 785,402

Int. Cl.[2] F16K *1/16*

U.S. Cl. 251—298 1 Claim



1. A rotary valve for use in a conveying passage for granular material consisting of a vertically disposed valve casing, a sealing means fixed to the downstream end of said valve casing and having a central opening permitting passage of said granular material therethrough, a tubular material conveying path member vertically disposed within said valve casing and extending in the direction of material flow to terminate in a lower end adjacent to said sealing means to define a first gap therebetween, and a valve member disposed to be swingable within said valve casing for making slidable engagement with said central opening of said sealing means in the area of said first gap defined between said sealing means and said end of said material conveying path member, a short auxiliary pipe larger in diameter than said conveying path member and fixed to the path member such that a ring-shaped space is formed between the auxiliary pipe and an outside surface of said path member and such that a lower end of said auxiliary pipe forms a second gap with said inner peripheral surface of said valve member which is larger than said particles, said valve member being spaced around said conveying path member such that an inner peripheral surface of said valve member and said end of said conveying path member form a third gap which is larger than said particles, is the same as said second gap and is configured such that a bridge effect prevents said granular material from passing therethrough, said valve member having an opening to permit passage of the material therethrough when said opening registers with said central opening of said sealing means and said opening is larger than an inner diameter of said path member, said central opening having a greater areal extent than and substantially circumscribing said opening in said valve member so that contact between said sealing means and said granular material is substantially avoided.

4,130,269

TELESCOPIC TURNBUCKLE

Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

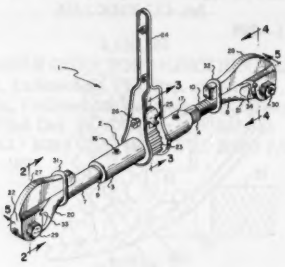
Filed Feb. 7, 1978, Ser. No. 875,782

Int. Cl.[2] B66F *3/10*

U.S. Cl. 254—67 11 Claims

1. A load binder (1) of the type having an axially extending tubular body (2) with first and second opposite end portions (3, 4) having right and left hand threads (5, 6) on their respective inner surfaces and including first and second axially extending threaded members (7, 8) with exterior threads (9, 10), each member being adapted to engage said threads of one of said opposite end portions (3, 4), said first member (7) having an axially extending cylindrical void (11) adapted to telescopically receive therewithin said second member (8), said second member (8) having an outside diameter smaller than the inside

diameter of said cylindrical void (11) characterized in that said second member (8) includes a threaded length at least long enough to extend from the axially outermost end (12) of one of said end portions (4) to a position radially adjacent to the interior threads (5) of the opposite end portion (3), the threads (10) of said second member (8) having a pitch which is greater



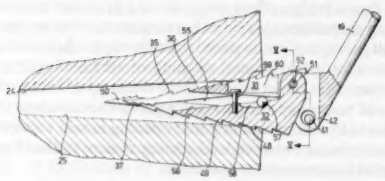
than the pitch of the threads (9) of said first member (7) and said cylindrical void (11) of said first member (7) has a length at least long enough to extend from the axially innermost end (13) of one of said end portions (14) to a position radially adjacent to the interior threads (5) of the opposite end portion (3).

4,130,270

WEDGE ARRANGEMENT

Einar W. Andersson, Gavle, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Oct. 18, 1977, Ser. No. 843,310
Int. Cl.[2] B66F *15/00*
U.S. Cl. 254—104 **8 Claims**



1. A wedge arrangement for forceably spreading apart the opposing surfaces of a saw cut made in a tree, comprising:

(a) a first pointed wedge member having at least two spaced, parallel fingers,

(b) a second pointed wedge member having at least one finger disposed in the space between said two fingers of the first wedge member, the second wedge member having substantially the same length as the first wedge member,

(c) wood gripping means on the outer surfaces of each wedge member directed rearwardly from the respective points thereof for engaging the opposing surfaces of a saw cut in a tree, and

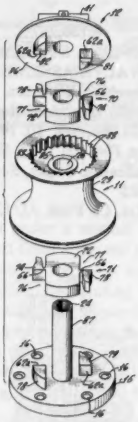
(d) drive means coupled to the first and second wedge members for alternately applying an axial force to each of said members to successively advance the wedge arrangement into the saw cut in a step-by-step manner.

4,130,271

SYNTHETIC RESIN RATCHET WINCH

Franklin Merriman, 524 DeAnza Dr., Corona del Mar, Calif. 92625

Continuation of Ser. No. 729,809, Oct. 5, 1976. This application Apr. 3, 1978, Ser. No. 893,056
Int. Cl.[2] B66D *1/30*
U.S. Cl. 254—150 R **8 Claims**



2. A ratchet winch for sailboats, which comprises:

(a) a synthetic resin base adapted to be anchored on the deck of a sailboat,

(b) a post extending upwardly from said base, in fixed relationship relative thereto,

(c) a synthetic resin drum mounted rotatably on said post, said drum having a recess at the lower end thereof, there being internal teeth provided internally on said drum at said recess,

(d) synthetic resin pawl means disposed on said base, said pawl means comprising a synthetic resin body, said pawl means further comprising a synthetic resin pawl shaped to lock with said internal teeth to prevent rotation of said drum in one direction, said pawl means further comprising a synthetic resin flexural beam extending between said body and said pawl, said flexural beam being sufficiently flexible to flex and permit rotation of said drum in the direction opposite to said one direction, despite the presence of said teeth, and

(e) boss means provided fixedly on said base and extending upwardly therefrom to provide a stop for said pawl, said boss means being positioned to be directly engaged by said pawl, when an attempt is made to rotate said drum in said one direction, so that the force is transmitted from one of said teeth through said pawl directly to said boss means for effective prevention of said rotation in said one direction, said boss means also being positioned to permit movement of said pawl and said flexing of said beam when said drum is rotated in said direction opposite to said one direction.

4,130,272

FLEXIBLE PICKET FENCE

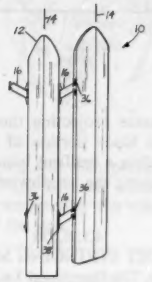
George W. Emmie, 4141 Nicholas Dr., Sterling Heights, Mich. 48077

Filed Sep. 22, 1977, Ser. No. 835,666
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—22 **4 Claims**

1. A flexible picket fence comprising:
a plurality of parallel, laterally spaced pickets; and

a plurality of parallel pairs of stringers interconnecting said pickets, each stringer having opposite ends pivotally attached to adjacent, laterally spaced pickets such that said pickets and their associated stringers are movable with respect to each other about an axis parallel to the longitudinal axis of said pickets while maintaining said pickets in said parallel relationship and permitting said pickets to be disposed along a curved path,

each of said pickets having a front wall and side walls connected thereto, each side wall having longitudinally spaced connecting joints, each of said connecting joints having a slot dividing the joint into upper and lower recesses including circular rings adjacent to said slot between said slot and the upper and lower recesses, said recesses having a circular configuration, each of said stringers having tubular end sections, said tubular end sections being matingly received by said picket recesses to permit pivotal movement between said pickets and said stringers.



4,130,273

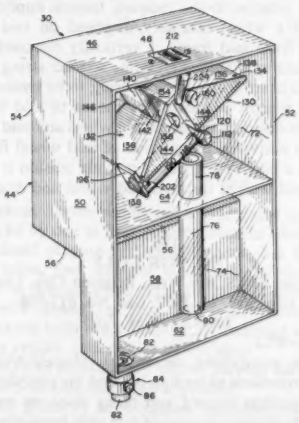
SILVER RECOVERY IMPROVEMENTS

Gunter G. Woog, P. O. Box 43, West Bend, Wis. 53095

Filed Apr. 15, 1977, Ser. No. 788,052

Int. Cl.[2] C22B *11/12*; G01W *1/14*

U.S. Cl. 266—79 **3 Claims**



1. An apparatus for recovering metal from a liquid comprising said metal, the apparatus comprising:

a metal recovery chamber through which the liquid is caused to flow in contact with the surfaces of objects of metal higher in the electromotive series than the metal in the liquid so that said mentioned metal is precipitated through ionic exchange, which precipitated metal may later be removed and refined;

a single container externally carried adjacent the metal recovery chamber, said single container liquid influent means, metering means and sampling means;

said metering means being disposed within the container and receiving all the liquid caused to flow through the metal recovery chamber, said metering means comprising means measuring the quantity of liquid caused to flow through the chamber during a predetermined interval of time and unobstructed liquid effluent discharge means; and

said sampling means being disposed within the container and receiving only a negligible amount of the liquid measured by the metering means, said sampling means comprising storage means, means periodically causing samples of said liquid to be deposited cumulatively in the storage means and selectively operable sample effluent discharge means.

4,130,274

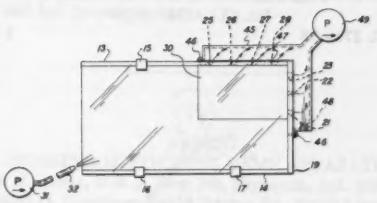
PNEUMATIC REGISTRATION APPARATUS

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 627,571, Oct. 31, 1975, abandoned. This application Mar. 8, 1977, Ser. No. 775,508

Int. Cl.[2] B65H *9/00*

U.S. Cl. 271—236 **1 Claim**



1. Apparatus for registering a sheet with respect to perpendicularly related axes, the sheet having a length and width within predetermined ranges, comprising:

(a) a sleeve for internally accommodating said sheet, having a top plate and a bottom plate, at least a section of one of the plates being transparent to provide a substantial view of a registered sheet, and at least one point on an inner narrow wall of the sleeve being coincident with one of the axes;

(b) a stop located at one end of the sleeve, the stop having at least one point coincident with the other of the axes; and

(c) means, remote from said transparent section, for providing in the sleeve a fluid stream having velocity components normal to each of the axes, whereby when a sheet is placed in the sleeve the stream moves the sheet into abutment with each of said points, wherein said means for providing a fluid stream includes at least one port in said stop and at least one port in said narrow wall, and wherein said means for providing a fluid stream includes a manifold coupled to at least one of the ports and a pump for discharging fluid from the manifold.

4,130,275

SKEW CONTROL MECHANISM FOR SHEET MATERIAL

Vincent E. Rozga, Greendale, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.

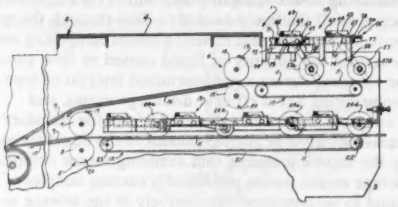
Filed Jan. 26, 1977, Ser. No. 762,476

Int. Cl.[2] B65H *9/16*

U.S. Cl. 271—251 **4 Claims**

1. A skew control mechanism for controlling skewing of cut sections of sheet material, comprising a supporting structure, conveyor means carried by the supporting structure for conveying said cut sections in a downstream direction, a pair of tracks located at opposite sides of the conveyor, and a skew control unit mounted above the conveyor, said skew control

unit including a frame mounted for movement on said tracks, locking means for locking the frame against movement on said tracks in said downstream direction, said skew control unit including pressure means disposed to engage the upper surfaces of the cut sections moving on the conveyor and mounted for floating movement in a vertical plane, said skew control unit being removable from said tracks on release of said locking means.



4,130,276
EXERCISING DEVICE

Joseph R. Tricarico, 1955 Williamsbridge Rd., Bronx, N.Y. 10461

Filed Jun. 9, 1977, Ser. No. 805,082
Int. Cl.[2] A63B *69/26*
U.S. Cl. 272—78 1 Claim

1. An exercising device for a user having a neck and a head, said exercising device comprising

a ball having a size substantially that of a user's head, said ball having an eye loop extending therefrom;

a closed loop of elastic strip-like material fittable over the user's head and around the user's neck; and

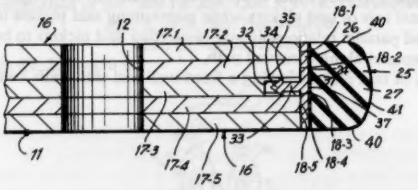
a strap of strip-like material having spaced opposite first and second ends and a buckle affixed to the first end thereof, said strap passing through the eye loop of said ball and through said closed loop and the second end of said strap being adjustably secured to said buckle thereby providing an adjustable closed loop tethering said ball to said closed loop of elastic material in a manner whereby the user is enabled to knee, kick and throw said ball.

4,130,277
COMPOSITE PADDLE RIM

Nathan Marks, Garfield, N.J., assignor to Marcraft Recreation Corp., Garfield, N.J.

Filed Jul. 1, 1977, Ser. No. 812,071
Int. Cl.[2] A63B *59/00*
U.S. Cl. 273—67 R 7 Claims

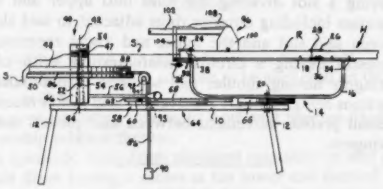
1. A composite protective rim in combination with a game paddle having a handle portion and a blade portion including opposed substantially planar surfaces, comprising rim means surrounding at least a portion of the periphery of said blade portion defined by said opposed planar surfaces, said rim means including an elongated metal element, said element having operative means projecting therefrom for anchoring said element to said blade portion of said paddle, said rim means further including a resilient bumper means bonded to said metal element along the lengthwise extent thereof.



4,130,278
RACQUET STRINGING MACHINE

Robert L. Gutzwiller, 730 Barr Crest Ln., Lancaster, Pa. 17603

Filed Jun. 21, 1977, Ser. No. 808,538
Int. Cl.[2] A63B *51/14*
U.S. Cl. 273—73 A 17 Claims



1. An improved racquet stringing machine having a base, a racquet supporting frame means pivotally connected to said base, retaining means on said frame for fixing the racquet relative to said frame, first string clamping means adapted to engage said frame and a string under tension to hold the tensioned string relative to the racquet, tension applying means comprised of a wheel rotatably disposed on said base and spaced apart from said frame, a vertically disposed drum on said wheel and rotatable therewith, second string clamping means on said drum for holding a string to be tensioned and a free hanging weight connected by means to said wheel, and locking means disposed between said wheel and said frame and automatically activated by rotation of said wheel for holding said frame in a preselected position while tension is applied to a string by said weight through said wheel and drum.

4,130,279
INDOOR GOLF

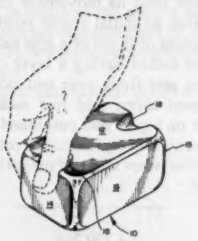
Samuel C. Ross, 510 S. 8th West, Brigham City, Utah 84302

Filed Jul. 21, 1977, Ser. No. 817,558
Int. Cl.[2] A63F *7/06*
U.S. Cl. 273—87.2 7 Claims

1. A game comprising rectangular shaped hollow clubs having no projections extending beyond the peripheral rectangular configuration thereof and being open on one side for insertion of the fingers, the top of said club having indentations for thumbs; a series of sequentially numbered indicators detachably connectable to a furniture leg in numerical order, golf balls to go with the clubs, and a scorecard.

7. A method of playing a golf game with rectangular shaped hollow clubs having a base and no projections extending beyond the peripheral rectangular configuration thereof which comprises sequentially numbering furniture legs with an indi-

cator, placing the fingers in the hollow club and the thumb in an indentation at the top of the club, striking a golf ball with the face of the club until the ball touches the first sequentially



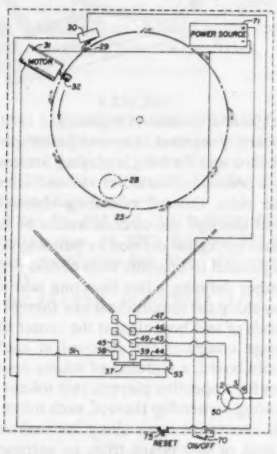
numbered furniture leg and then proceeding to the next sequentially numbered leg until all numbered legs have been contacted and then computing the total number of strokes taken to strike all of the legs.

4,130,280

GAME APPARATUS

Joseph Lowell, 139 Sutro Heights Ave., San Francisco, Calif. 94121

Filed Dec. 20, 1977, Ser. No. 862,267
Int. Cl.[2] A63F *7/06*
U.S. Cl. 273—87.2 **11 Claims**



11. A game device simulating a golf game and capable of being played by one to four players wherein a ball is propelled up an inclined playing surface and through a first hole of a series of holes, and wherein when each of the players has succeeded in placing a ball through the first hole, that hole is automatically closed, the next hole is automatically opened, and the played balls are automatically returned to the playing surface for replay, said device comprising:

(a) an inclined substantially planar playing surface having a plurality of ball receiving apertures;

(b) a like plurality of weighted movable cover members, each of said cover members being loosely disposed in a respective aperture and connected to said playing surface by a hinge device;

(c) a rotatable disk mounted beneath said playing surface for retaining said cover members in a closed position to cover said apertures and having an opening for permitting a cover member to fall into the open position when the disk is rotated to align the opening with a cover member, said disk having a plurality of cams located around the periphery;

(d) at least four balls having electrically conductive surfaces;

(e) a rotatable spring device including means for propelling said balls up said inclined playing surface and means for aiming said balls toward said apertures;

(f) an electrical power source;

(g) means for selecting the number of balls to be played;

(h) a channel for retaining said selected number of balls having been played, said channel further comprising a movable gate for stopping the movement of said selected number of balls, and at least four pairs of electrically conductive plates, each of said pairs defining a space for the retention of one of said balls, said spaces defining gaps in an electric circuit;

(i) a motor for rotating said disk when said selected number of balls is retained in said channel to close an open cover member and open another cover member of said plurality of cover members;

(j) a solenoid connected to said gate for opening said gate when said selected number of balls is retained in said channel;

(k) a switch located in close proximity to the periphery of said disk for stopping the rotation of said disk when said switch is contacted by one of said cams; and

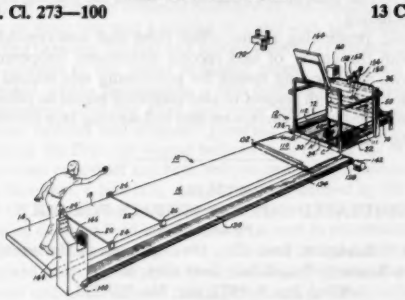
(l) lifting means for returning said selected number of balls to said ball propelling means.

4,130,281

HORSESHOE PITCHING GAME APPARATUS

Ralph E. Leber, R.R. 2, Box 248, Plymouth, Ind. 46563, and Robert O. Baughman, 24633 Stanton Rd., North Liberty, Ind. 46554

Filed Jul. 29, 1977, Ser. No. 820,090
Int. Cl.[2] A63B *67/06*
U.S. Cl. 273—100 **13 Claims**



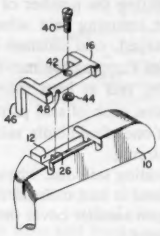
1. A horseshoe pitching game apparatus comprising a court with a player station at one end, a shoe receiver assembly with a pit and a stake at the other end and a lane between said station and shoe receiver assembly, particulated material in said pit for receiving the pitched shoes, a conveyor means including a conveyor belt disposed in front of said pit, extending between said station and pit assembly for transporting pitched shoes from the pit assembly to the station, a backboard and two sideboards at the edge of said pit for confining the pitched shoes, a means for removing the pitched shoes from the pit and depositing them on said conveyor belt in front of said pit, a means movable in a horizontal plane over said pit for smoothing said material between pitches of the shoes after the shoes have been removed from said pit, and means adjacent said station for receiving the shoes returned by said conveyor means.

4,130,282

GOLF PUTTING SYSTEM FOR PLAY AND PRACTICE

David T. Pelz, 13129 Oriole Dr., Beltsville, Md. 20705

Continuation-in-part of Ser. No. 580,243, May 23, 1975, Pat. No. 4,025,078. This application May 23, 1977, Ser. No. 799,431
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 A 6 Claims



1. A putting system for practicing and playing golf whereby a golfer is able to use the same golf club for both practice and playing wherein the improvement comprises

a clubhead including a ball striking face,

a first attachment adapted to be attached to said clubhead,

a second attachment adapted to be attached to said clubhead, means for receiving one of said attachments including locating means for locating one of said attachments at said receiving means,

said first attachment adapted for use in the practice mode and including spaced elements at the ends of said attachment and projecting outwardly from said attachment, and

first positioning means offset from and non-symetrical with the center of said first attachment, said first positioning means cooperating with said locating means for positioning said first attachment with respect to said receiving means whereby said spaced elements are positioned forwardly of said ball striking face to form a restricted area on said ball striking face for striking a golf ball,

said second attachment adapted for use in the playing mode including

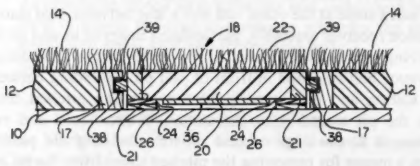
second positioning means offset from and non-symetrical with the center of said second attachment cooperating with said locating means for positioning said second attachment with respect to said receiving means to provide an unobstructed surface on said ball striking face for striking a golf ball.

4,130,283

SIMULATED FAIRWAY SURFACE FOR GOLF APPARATUS

Everet F. Lindquist, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Jan. 6, 1977, Ser. No. 757,238
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—195 A 4 Claims



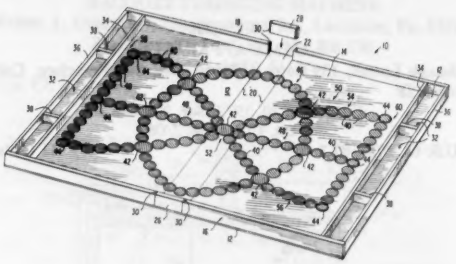
3. A device for simulating actual fairway turf so as to provide for proper execution of a golf shot when a golf ball resting on said device is struck by a golf club, said device comprising a supporting base, artificial turf means having front, rear and side margins supported by and slidably movable relative to said base along a path generally in a horizontal plane, said artificial turf means and said base having corresponding tongue and groove portions slidably engagable with each other to guide said turf means and limit its movement relative to said base along said path from an initial at-rest position forwardly primarily in the direction of flight of a golf ball when struck by a golf club, said turf means having a layer of resilient material extending between said front, rear and side margins so as to provide a cushioned layer, said turf means also having an artificial turf layer on top of said cushioned layer, and resilient means combined with said turf means to return said turf means to said initial position when said turf means is moved forwardly during a golf shot.

4,130,284

TRAFFIC JAM BOARD GAME

Abram Fuks, 5724 Jumilla Ave., Woodland Hills, Calif. 91364

Filed Aug. 19, 1977, Ser. No. 826,037
Int. Cl.[2] A63F *3/04*
U.S. Cl. 273—248 7 Claims



1. A board game apparatus comprising:

a playing board, a segmented series of intersecting pathways on said board and forming a playing area, said pathways defining a centrally located circle and sides of an hourglass, the sides thereof extending through a common center and through the circumference of said circle, the ends of said hourglass defined by pathways disposed adjacent and parallel to opposite ends of said board, said pathways further defining a line bisecting said circle and said hourglass along the longitudinal axis thereof and intersecting the ends of said hourglass at the center thereof; at least one storage compartment disposed at each of opposite ends of said board; a plurality of tokens constituting playing pieces for respective players, said tokens having means for indicating ownership thereof, each token adapted to be moved in successive turns along the pathways across the playing area of said board from an entrance point to an exit point; at least one pair of dice for indicating the advance of players' tokens along the pathways at successive turns.

4,130,285

VALVE SEALING DEVICE

Ritchie W. Whitaker, Claremont, Calif., assignor to Walworth Company, Valley Forge, Pa. and Kryoflo, Inc., Santa Ana, Calif.

Filed Jan. 26, 1978, Ser. No. 872,731
Int. Cl.[2] F16K *25/00;* F16J *15/32, 15/48*
U.S. Cl. 277—12 17 Claims

1. In a valve comprising:

a valve body member having a fluid flow passage therethrough; and

a valve closure member movable between valve open and valve closed positions;

an annular sealing surface on one of said members; and

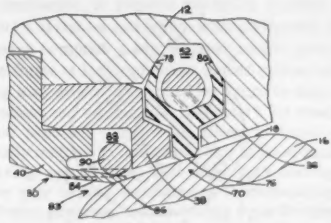
an opposing annular sealing device on the other of said members;

said sealing device comprising;

an annular groove having a relatively narrow opening and then increasing in width to the groove side walls to form a pair of shoulders on opposite sides of said opening;

portions of said side walls converging away from said narrow opening; and

a resilient seal ring in said annular groove;



said seal ring having a narrow sealing portion extending through said narrow opening and a wider body portion engagable with said groove shoulders; and

generally radial flexible lips extending from both sides of said body portion for sealing engagement with said converging side wall portions;

said sealing portion in said valve open position being disposed to interfere with said annular sealing surface whereby in closed position said body portion is forced away from said shoulders and said radial lips are pressed against said converging side wall portions.

4,130,286

PACKING MEANS FOR SHAFT BUSHINGS

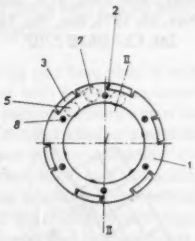
Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Continuation of Ser. No. 513,085, Oct. 8, 1974, abandoned. This application Nov. 16, 1977, Ser. No. 851,985

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1973, 7338017[U]

Int. Cl.[2] F16C *19/00;* **F16J** *15/32*

U.S. Cl. 277—12 **11 Claims**



1. A ball bushing for journalling a shaft comprising an annular cage having ball-receiving bores therein, balls within said bores and race means retaining said balls within said cage, and a resilient packing releasably secured to the frontal end of said cage for sealing the space between the shaft and the frontal end of the cage, said packing being formed with an annular body adapted to engage the shaft and connecting means projecting axially from said body and extending circumferentially thereabout, said cage being formed with axial recess means cooperable with and dimensioned to receive the connecting means on said packing body, said connecting means and recesses being provided with cooperable extensions thereof extending transverse to the central axis of said packing to removably interlock said packing and cage together on stressing of said packing about said shaft, said race means and packing being cooperable to resiliently retain the end of said race means and said packing in interengaging relationship.

4,130,287

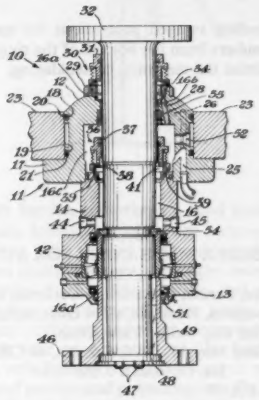
MECHANICAL SEAL ASSEMBLY WITH FLUSHING MEANS

Robert H. Ritzie, Mystic, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 23, 1977, Ser. No. 853,938

Int. Cl.[2] F16J *15/36*

U.S. Cl. 277—12 **3 Claims**



1. A mechanical seal assembly for the transfer of rotary motion through the wall of a vessel, the assembly comprising a housing, the housing defining a vessel engaging means and a generally, centrally disposed passageway, the housing having a first or inner end and a second or outer end, the passage extending between the first and second ends in a direction generally normal to the vessel engaging means, a rotatable shaft disposed within the housing, a first bellows seal in operative engagement with the shaft and inner end of the housing, a second bellows seal disposed generally, centrally within the housing, the first and second bellows seals having the bellows supported on a shaft and both bellows resiliently tensioned in a like direction, a generally annular passage defined by the shaft and the housing extending between the two bellows seals, the housing defining fluid inlet and outlet means in communication with the annular passage, the inlet and outlet means being disposed generally between the vessel engaging means and the second end, a self-aligned bearing disposed generally adjacent the second end of the housing and rotatably supporting the shaft therein.

4,130,288

PISTON RING

Kenneth J. Nisper, Spring Lake, Mich., assignor to Questor Corporation, Toledo, Ohio

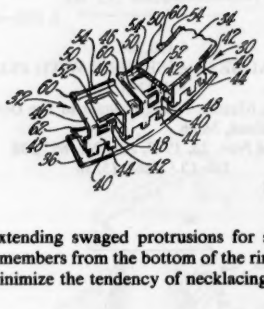
Filed Apr. 20, 1977, Ser. No. 789,022

Int. Cl.[2] F16J *9/06*

U.S. Cl. 277—216 **6 Claims**

1. In a rail supporting member for a piston ring, said rail supporting member comprising a plurality of circumferentially-arranged body sections, an upper row and a lower row of radially inwardly extending leg portions integrally connected with the body sections, said radially inwardly extending leg portions of each row being arranged for engagement with individual rail members, and an upper row and a lower row of bridge portions connecting the inner ends of pairs of the in-

wardly extending leg portions, said bridge portions providing abutments for engaging the inner edges of the rails members, the bridge portions of each row being provided with radially



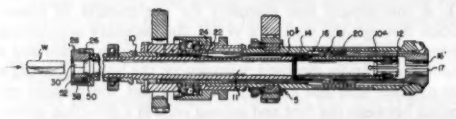
inwardly extending swaged protrusions for spacing the rail supporting members from the bottom of the ring groove in the piston to minimize the tendency of necklacing.

4,130,289

WORK HOLDER MECHANISM FOR AUTOMATIC MACHINE TOOL

Chester S. Zajac, Parma; Frederick T. Cockram, Lyndhurst, and Scott B. Thompson, Westlake, all of Ohio, assignors to Zamco Manufacturing Co., Valley View, Ohio

Filed May 17, 1976, Ser. No. 687,358
Int. Cl.[2] B23B 5/22, 5/34
U.S. Cl. 279—1 A **14 Claims**



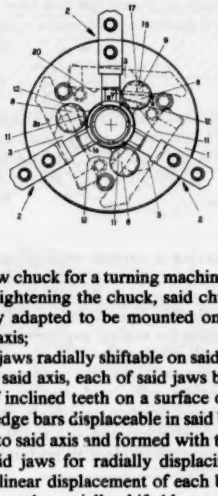
1. A work holder for an automatic tool machine, comprising, a chuck carrying tube, a stock feed tube arranged within the chuck carrying tube and having feeding jaws including faces defining a predetermined non-circular passage configuration in transverse section, and an adjustable, non-gripping stock aligning device at the intake end of said feed tube for aligning non-circular in cross section, stock with said faces of said feeding jaws, said aligning device comprising an axially apertured collar at least a portion of which is of generally cylindrical exterior configuration rotatable with respect to said feed tube, the aperture through said collar being non-circular in transverse section, generally complementary to said non-circular passage configuration, said intake end having an opening formed therein generally complementary to the exterior of said collar and receiving said cylindrical portion interiorly thereof in rotatable relation, and including wedge means mounted on said collar, said collar having a slot in the exterior of said cylindrical portion extending generally parallel to the lengthwise axis of said aperture through said collar, said wedge means comprising a wedge block movable generally axially in said slot relative to said collar and adapted for abutting holding coaction with the defining surface of said intake end opening and with said collar, for locking the aligning device in selected rotated position wherein the defining surfaces of the aperture through said collar will be aligned with said faces of said feedings jaws, and means coacting between said wedge means and said collar for selectively actuating and deactuating said wedge means.

4,130,290

RADIAL-JAW CHUCK FOR LATHES AND LIKE TURNING MACHINES

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Germany

Filed Oct. 28, 1977, Ser. No. 846,451
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 7633955 [U]
Int. Cl.[2] B23B 5/22, 5/34, 31/16; B25G 3/22
U.S. Cl. 279—121 **10 Claims**



1. A radial-jaw chuck for a turning machine having a spindle and means for tightening the chuck, said chuck comprising

a chuck body adapted to be mounted on said spindle and having an axis;

a plurality of jaws radially shiftable on said body toward and away from said axis, each of said jaws being formed with an array of inclined teeth on a surface of the jaw;

respective wedge bars displaceable in said body in directions transverse to said axis and formed with teeth engaging the teeth of said jaws for radially displacing the respective jaws upon linear displacement of each bar;

a tightening member axially shiftable on said body by said means for tightening the chuck;

respective drive pins axially shiftable in said body and engaged by said member for axial displacement thereby; and

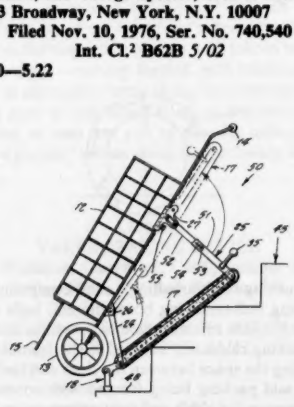
a respective wedge mechanism between each of said pins and the respective bar for translating axial displacement of the respective pin into corresponding linear displacement of the respective bar.

4,130,291

SHOPPING CART CAPABLE FOR USE ON STAIRS

Magnus Saethre, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Nov. 10, 1976, Ser. No. 740,540
Int. Cl.[2] B62B 5/02
U.S. Cl. 280—5.22 **3 Claims**



1. A shopping cart adapted for use on flat surfaces and stairways, comprising a basket mounted on a frame including a front end with a handle and a rear end with a pair of wheels in further combination with a retractable endless mechanism

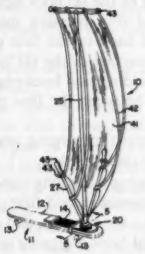
track secured at front and rear ends to the frame between the handle and wheels, said frame and track mechanism including coacting securing means for pivoting said track mechanism from a lower position spaced from said frame and wheels to an upper position flush with said frame whereby said track mechanism is located beyond said wheels to fully engage stairs when in the lower position and whereby said wheels are free to fully engage flat surfaces when the track is in the upper position, including means for securing the track mechanism in said positions and a rear stop mounted resiliently on said rear end of said track mechanism to provide automatic vertical support when the cart is at rest on a stairway, wherein the said coacting securing means comprise a pair of lever means pivotally secured to the frame at longitudionally spaced points, said lever means being also pivotably secured at opposite ends to said track mechanism and wherein the said means for securing the track in said positions comprise brackets mounted on said frame pivotally secured to one of said pair of lever means, said brackets having spaced holes that align with corresponding holes in one pair of said lever means corresponding to the upper and lower positions, and including a pin for removably locking said one of said pair of lever means and bracket at said positions.

4,130,292

APPARATUS FOR PROPELLING A SKATE BOARD WITH WIND CURRENTS

A. Michael Lorenz, 421 55th St., Downers Grove, Ill. 60515

Filed Aug. 22, 1977, Ser. No. 826,633
Int. Cl.[2] A63C *3/00*
U.S. Cl. 280—11.37 S **6 Claims**



1. Apparatus for propelling a skate board with air currents, said apparatus comprising:

a base plate;

means for securing said base plate to said skate board;

a swivel member with one end mounted to said base plate and an upper portion defining a mast receptacle at another end, said one end including an upstanding tubular segment and said upper portion including a depending tubular segment disposed about said upstanding tubular segment, said upstanding tubular segment having outwardly flaring ends and said depending tubular segment having an inwardly flaring end, and bearing means between said tubular segments providing free rotational movement of said mast receptacle in relation to said base plate without appreciable tilting movements therebetween;

a mast adapted for insertion into said mast receptacle in a generally vertical orientation;

handle control means in fixed relation to said mast for controlling the angular rotational position of said mast in relation to said base plate; and

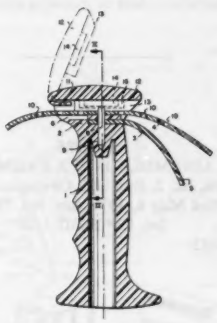
a substantially transparent sail supported by said mast and said handle control means for receiving air currents and for transmitting forces of such air currents to the apparatus for propelling the skate board.

4,130,293

SKI POLE HANDLE OF SYNTHETIC RESIN

Ignaz Hinterreiter, Ramsauerstrasse 119, Linz, Austria (A-4020)

Filed Jul. 22, 1977, Ser. No. 817,968
Claims priority, application Austria, Jul. 26, 1976, 5464/76
Int. Cl.[2] A63C *11/22*
U.S. Cl. 280—11.37 H **3 Claims**



1. A ski pole handle, comprising a head portion including two lateral walls defining therebetween a recess open on top and at respective ends thereof, a cover movable between a closed and open position into and out of the recess through the open top between the two lateral walls, and a flexible web integrally and hingedly connecting the cover to the lateral walls of the head portion at one of the recess ends whereby the web bridges the one open recess end, the head portion, the cover and the web forming an integral unit of synthetic resin, a bolt in the head portion and projecting into the recess, a strap having two ends and formed into a loop projecting from the end of the recess opposite the one end, the strap ends defining apertures and being superposed in the recess, the bolt passing through registering ones of the apertures in the strap ends whereby the strap ends are fastened to the bolt, and the cover having portions pressing against an upper one of the superposed strap ends in the closed position thereof while permitting detachment of the upper strap end from the bolt in the open position.

4,130,294

COLLAPSIBLE SKI POLE SEAT

Laurine L. Walker, 2210 Nome St., Aurora, Colo. 80010

Filed Jun. 14, 1977, Ser. No. 806,488
Int. Cl.[2] A63C *11/22*
U.S. Cl. 280—11.37 E **7 Claims**

1. A two-part ski pole including a pointed tubular lower shaft section and an upper tubular shaft section sleevably positioned thereon, flexible rimmed fabric seat disc means attached at the upper end of said lower section and foldable to a collapsed tubular position in alinement with said section and expandable to a generally circular seat forming position rela-

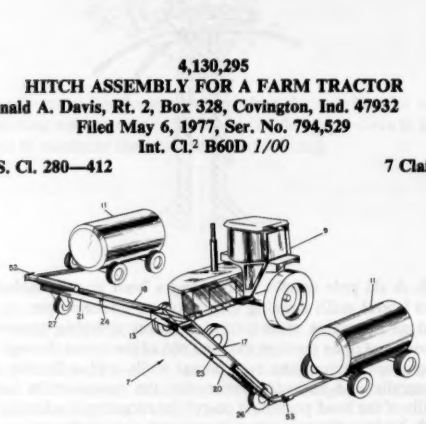
tive thereto, hinged strut means attachable to said seat disc means and to said upper tubular shaft section for supporting said seat means in expanded seat forming position, said upper section entirely concealing and housing said seat disc means when sleeved over the latter when collapsed and assembled on said lower section, and said upper section being removable therefrom.

4,130,295

HITCH ASSEMBLY FOR A FARM TRACTOR

Donald A. Davis, Rt. 2, Box 328, Covington, Ind. 47932

Filed May 6, 1977, Ser. No. 794,529
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—412 **7 Claims**



5. A hitch assembly for a farm tractor, said hitch assembly comprising:

a mount for mounting said hitch assembly to the front of a farm tractor;

a pair of inner strut members each of which has an inner end connected to said mount with said inner strut members extending outwardly and forwardly from opposite sides of said mount and terminating at outer ends;

a pair of outer strut members having inner and outer ends;

hinge means connecting the outer end of each of said inner strut members with the inner end of a different one of each of said outer strut members to establish a substantially vertical hinge axis therebetween whereby said outer strut members may be pivoted forwardly about a substantially vertical axis so that the outer end of each of said outer strut members may be pivoted to a position contiguous to and forwardly of said mount;

a pair of ground engageable wheels each of which is mounted at the outer end of a different one of each of said outer strut members, each of said wheels being mounted to be freely pivotable about a substantially vertical axis;

a pair of extendible arms having inner and outer ends with the inner ends of each of said arms being received in the outer and of a different one of each of said outer strut members, said arms being lengthwise movable with respect to said outer strut members whereby each of said arms may be moved into and out of said strut members to vary the distance of the outer ends of said arms from the outer ends of said strut members;

releasable positioning means for maintaining said extendible arms in a predetermined position with respect to said outer strut members; and

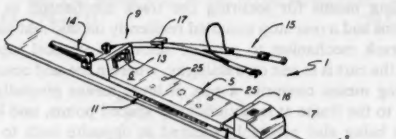
connecting ears attached to the outer ends of said arms whereby ancillary farming equipment may be connected thereto so that when so connected said equipment is maintained outwardly of said tractor as said equipment is pulled in a forward direction by said tractor.

4,130,296

SKI-BINDING

Nicholas F. D'Antonio, Liverpool, and Richard L. Bates, Camillus, both of N.Y., assignors to Kinetronic Industries, Media, Pa.

Filed Jun. 30, 1976, Ser. No. 701,301
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—612 **37 Claims**



1. A ski binding for releasably securing a ski boot to a ski and for releasing the ski boot upon the application of predetermined forces to the ski boot, said ski binding comprising:

boot engaging means for engaging structure associated with a ski boot disposed in the ski binding for securing the ski boot to the ski, said boot engaging means being movable between a first position for securing the ski boot to the ski and a second position for releasing the ski boot from the ski; and said boot engaging means comprising: first biassing means for urging said boot engaging means towards said first position, said boot engaging means being movable from said first position towards second position in response to the insertion of a ski boot into the ski binding and the pressing of the ski boot against said boot engaging means, and said first biassing means moving said boot engaging means back to the first position upon the completion of the insertion of the ski boot into the ski binding;

guide means for guiding said boot engaging means in a linear path on the ski between the first position and the second position;

second biassing means for urging said boot engaging means towards said second position;

latching means having a latching condition for retaining said boot engaging means in said first position against the bias of said second biassing means, and an unlatching condition for releasing said boot engaging means to the bias of said second biassing means; and

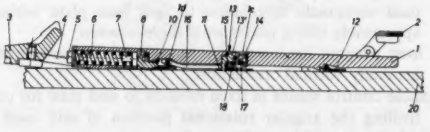
unlatching means for placing said latching means in the unlatching condition in response to the application of said predetermined forces to the ski boot.

4,130,297

RELEASE SKI BINDING

Hans Horn, Wellington, New Zealand, assignor to TMC Corporation, Baar, Zug, Switzerland

Filed Apr. 27, 1977, Ser. No. 791,408
Claims priority, application Austria, Apr. 30, 1976, 3216/76
Int. Cl.[2] A63C *9/086*
U.S. Cl. 280—618 **24 Claims**



1. A release ski binding, comprising:

an elongate release plate having means defining a first recess in the bottom surface intermediate the ends thereof;

releasable holding means for releasably securing said release

plate to a ski, said releasable holding means including an upstanding pin means, adapted to be secured to said ski and received in said first recess to pivotally support said release plate for movement about the axis of said upstanding pin means, said upstanding pin means having an initial size greater than said first recess and including means for yieldingly reducing the diameter of said pin means to facilitate a snug reception in said first recess;

a first holding means adapted to be secured to said ski and operatively connecting said ski to said release plate adjacent one end thereof;

a second holding means adapted to be secured to said ski and operatively connecting said ski to said release plate at the other end thereof, said second holding means including an anchor member secured to said ski and variable force resilient means for continually urging said release plate to a position of use wherein the longitudinal axis thereof is parallel to the longitudinal axis of said ski when said release plate is held to said ski by said first and second holding means and providing a lesser magnitude of force to effect a release of said release plate in response to a movement thereof solely about said axis of said upstanding pin means than the force required to effect a release in response to a movement of said other end in any direction other than about said axis of said pin means, said release plate also having a second recess intermediate said first recess and said other end;

guide means mounted on said ski intermediate said pin means and said second holding meas, said guide means including a holding plate secured to said ski and a bar member pivotally secured to said holding plate about an axis extending transversely of the longitudinal axis of said ski and between a first position inclined relative to the upper surface of said ski and a second position generally parallel to said upper surface of said ski, said bar member being received in said second recess to guide said release plate into securement with said releasable holding means as said bar member is moved from said first position to said second position;

a first sole holder means mounted on said release plate adjacent one end thereof;

a second sole holder means mounted on said release plate adjacent said other end thereof, said second sole holder means including a pair of wire bars each having a leg with an inwardly turned end portion, the other ends of said legs being bent to define a pair of axially aligned axles, said release plate having means defining laterally opening recesses therein for receiving said axles therein to effect a pivotal securement of said bars to said release plate; and

a tensioning member pivotally secured to said end portions, said tensioning member having a pair of outwardly directed wings which engage said legs to thereby prevent an engagement of said tensioning member with a shell of a ski boot when said ski boot is releasably held between said first and second sole holders.

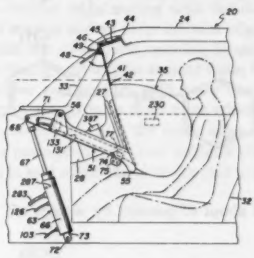
4,130,298

OCCUPANT RESTRAINT AND PROTECTION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Jerome Shaunnessey, 18 E. Willow Rd., Wheeling, Ill. 60090

Filed Jan. 12, 1976, Ser. No. 648,382
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—730 **30 Claims**

1. A system for restraining and protecting the driver and passengers of an automotive vehicle against injury as a result of a collision of the vehicle with another object, said vehicle including a vehicle body having laterally spaced windshield posts for supporting a windshield, a dashboard, the lower ends of said windshield posts intersecting said dashboard, a front seat for supporting the driver and one or more passengers in said vehicle body, and a roof overlying said seat, said system comprising expansible cushioning means adapted to be mounted on the underside of the roof of said vehicle body in a collapsed, inoperative position and expandable to an operative position engaging the laps and pelvic areas of the driver and passengers seated on the front seat of said vehicle body so as to restrain said driver and passengers against forward movement in said vehicle body and thereby prevent injury thereto in the event of a collision, a pair of elongated, laterally spaced arms adapted to be mounted in said vehicle body for movement about axes located adjacent to the intersection of the lower ends of said windshield posts with said dashboard and from inoperative positions adjacent to said windshield posts to oper-



ative positions wherein one end of each arm is disposed generally adjacent to the knees of the driver and passengers, said ends of said arms being connected to said cushioning means and operable to extend and hold the latter in its operative, expanded position extending laterally across the front seat of said vehicle body and engaging the laps and pelvic areas of the driver and passengers, and actuating means for effecting movement of said arms from their inoperative to their operative positions and expansion of said cushioning means.

4,130,299

LOW-ODOR DYE SOLVENTS FOR PRESSURE-SENSITIVE COPYING SYSTEMS

James C. Wygant, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 12, 1977, Ser. No. 832,698
Int. Cl.[2] B41M *5/16, 5/22*
U.S. Cl. 282—27.5 **12 Claims**

9. A pressure-sensitive recording system comprising

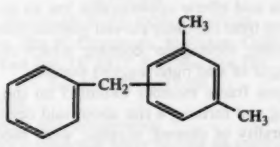
(A) a first support sheet having disposed thereon a coating of a pressure releasable marking fluid, and

(B) a second supporting sheet having disposed thereon a coating of an electron accepting material of the Lewis acid type arranged in contiguous juxtaposition with the coating on said first supporting sheet,

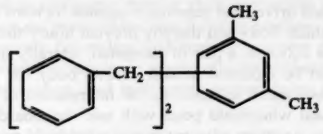
said marking fluid comprising a solvent and a colorless or substantially colorless chromogenic material dissolved therein, said chromogenic material being reactive with said Lewis acid type material to produce a colored mark and said solvent comprising a composition selected from the group consisting of:

(i)

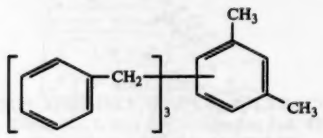
(a) at least about 70 percent by weight of:



(b) from about 10 to about 25 percent by weight of:

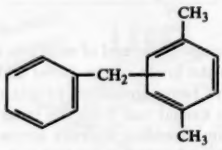


(c) from 0 to about 6 percent by weight of:

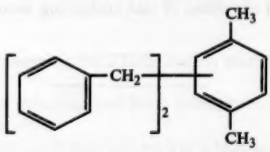


(ii)

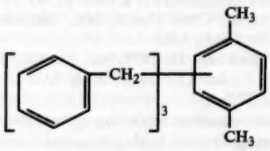
(a) at least about 65 percent by weight of:



(b) from about 15 to about 30 percent by weight of:



(c) from 0 to about 8 percent by weight of:



and (iii) isomeric or physical mixtures of (i) and (ii).

4,130,300

COMPOSITE ABRASION RESISTANT PIPE ELBOW

Joseph U. Sheridan, 400 Chadwick Dr., Havelock, N.C. 28532

Filed Feb. 6, 1978, Ser. No. 875,738

Int. Cl.[2] F16L *55/00*

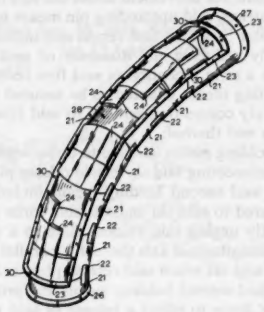
U.S. Cl. 285—16 **7 Claims**

1. A composite pipe elbow adapted to resist abrasive wear which comprises:

(a) a segmented elbow construction formed from a plurality of pipe sections initially cut from a straight steel pipe and wherein said elbow construction has an arcuate segment removed from the outer curved portion thereof to provide an arcuate, rectangular opening which extends through the length of said outer curved portion;

(b) an open frame member mounted on the edges of said opening and forming a rim about said opening;

(c) a plurality of shaped, ceramic wear blocks positioned across and filling said rectangular opening in a keystone configuration thrusting against said frame member and forming therewith an inner impact wall in the curved portion of said composite pipe elbow; and



(d) a cover plate positioned over said wear blocks and secured to said pipe elbow.

4,130,301

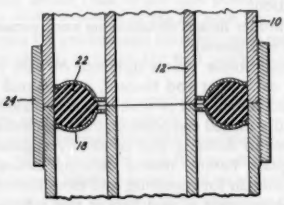
DOUBLE-WALLED WELL CASING STRUCTURE

Harry J. Dunham, Dickinson, and Gordon P. Hurd, Seabrook, both of Tex., assignors to General Electric Company, Fairfield, Conn.

Continuation of Ser. No. 544,517, Jan. 27, 1975, abandoned, which is a continuation of Ser. No. 268,337, Jul. 3, 1972, abandoned. This application Dec. 13, 1977, Ser. No. 860,419

Int. Cl.[2] F16L *59/14*

U.S. Cl. 285—47 **4 Claims**



1. A double-walled well casing structure for use in a working environment where the casing will carry a fluid which is hotter than the ambient temperature comprising:

concentric inner and outer pipe sections;

seal means at both ends of each pipe section sealing the cavity between said inner and outer pipes and supporting said pipes relative to each other; and

said seal means constructed of metal and sized so that it will be stressed beyond its yield point by the differential thermal expansion of the inner and outer pipes relative to each other when in their working environment.

4,130,302

TWIN POSITIVE AND NEGATIVE SEAL PIPE FITTINGS

Wylie W. Mitchell, Snellville, and Gordon W. Arrowood, Palmetto, both of Ga., assignors to Clyde A. Robdell; Leonard B. Rodbell; Paul N. Rodbell; Sidney P. Rodbell and Arthur T. Rodbell, all of Atlanta, Ga., a part interest to each

Filed Jul. 18, 1977, Ser. No. 816,909

Int. Cl.[2] F16L *13/14*

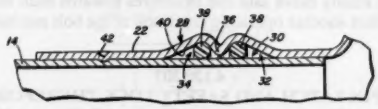
U.S. Cl. 285—113 **1 Claim**

1. A seal for coupling the ends of pipes together comprising:

a sleeve having openings concentrically receiving an end of each pipe into one of said openings;

a peripheral ridge formed in the sleeve in concentrically

surmounting relation to each pipe received within said sleeve, said peripheral ridge having four walls with the walls being of substantially constant cross sectional area and wherein the first and second walls slope outwardly at an angle from the external surface of the pipe and extend toward each other, the third and fourth walls being connected at an angle respectively to said first and second walls and form a continuous curved connection therewith, said third and fourth walls extending toward each other and extending toward the external surface of the pipe and being connected in a continuous curved surface to each other thus forming an annular bead, said bead being in spaced relation to the pipe;



said four walls thereby forming a single pressure chamber with the pressure chamber being partially partitioned into two sub-chambers by said annular bead extending toward and ending in a spaced relation to said pipe;

an O-ring packing member disposed in each sub-chamber, the packing members contacting respectively the curved connection between the first and third walls and the curved connection between the second and fourth walls, and contacting the external surface of the pipe, the O-rings thus forming twin positive and negative seals with both O-rings actively sealing at the same time; and

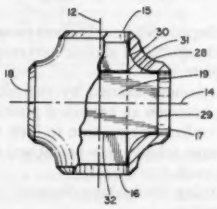
indentation means formed in the sleeve and in each pipe for securing the sleeve to the pipe.

4,130,303

REINFORCED PIPE CROSS FITTING

Henry H. George, Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.

Filed May 25, 1977, Ser. No. 800,325
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—137 R **8 Claims**



1. A reinforced pipe cross fitting of the type having four branches arranged in pairs, each pair being located on an axis, and the axes being coplanar and being oriented at right angles to each other, wherein an improvement comprises a rigid plate-like reinforcing element located in said fitting, said element being generally coplanar with the axes and extending substantially to the ends of each branch and reinforcing each branch of the fitting.

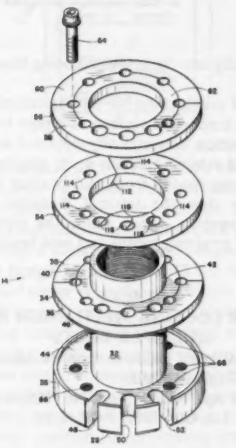
4,130,304

WELL HEAD SEAL ASSEMBLY

Harry D. Hebard, Tulsa, Okla., assignor to Don R. Hinderliter, Inc., Tulsa, Okla.

Filed Aug. 12, 1977, Ser. No. 824,000
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—143 **6 Claims**

1. An assembly providing a liquid-tight and gas-tight seal for a well head having an upper cylindrical opening therein, which comprises a ring-shaped seal body positioned in said head, said seal body having an outer cylindrical surface adapted to lie closely adjacent the cylindrical opening of said head, a central circular opening, and a radial slot extending inward from the outer cylindrical surface of said seal body to accomodate a cable therein; a tubular coupling adapted to connect between adjacent portions of tubing, said coupling connected to said seal body at said central opening; a lower seal ring having an inner circular section and an outer circular section, said inner section having a central circular opening adapted to surround said coupling and an outer circular edge, said outer section having an inner circular edge mating with the outer circular edge of said inner section and an outer circular edge adapted to lie closely adjacent the cylindrical opening in said head, said outer section also being split into an arcuate outer front section and an arcuate outer rear section, said outer circular section having a semi-circular hole on its inner edge which mates with a semi-circular hole provided on the outer edge of said inner section to form a passageway for said cable; a pliable rubber gasket positioned in said tubing head above said lower seal ring



and surrounding said coupling and having a circular hole and a slit leading thereto from the inner edge to accomodate said cable; an upper seal ring having an inner circular section and an outer circular section, said inner section having a central circular opening adapted to surround said coupling and an outer circular edge, said outer section having an inner circular edge mating with the outer circular edge of said inner section and an outer circular edge adapted to lie closely adjacent the cylindrical opening in said head, said outer section also being split into an arcuate outer front section and an arcuate outer rear section, said outer circular section having a semi-circular hole which mates with a semi-circular hole provided on the outer edge of said inner section to form a passageway for said cable, clamping means extending through said upper seal ring, said rubber gasket, said lower seal ring and into said seal body for locking said seal body, said inner coupling, said lower seal ring, said gasket and said upper seal ring in place in said tubing head and for forming a liquid-tight and gas-tight seal by compressing said gasket.

4,130,305

PUSH-IN PIPE CONNECTOR

Edward L. Parr, 301 N. Cuyamaca, El Cajon, Calif. 92020

Filed Jul. 11, 1977, Ser. No. 814,225
Int. Cl.[2] F16L *37/00*
U.S. Cl. 285—308 **10 Claims**

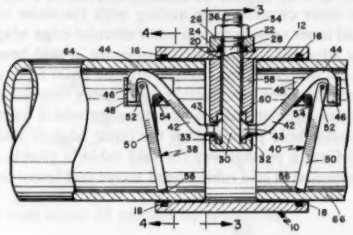
1. A pipe connector, comprising:

a substantially cylindrical body having an internal bore for receiving an end of a cylindrical pipe inserted therein;

a locking member releasably secured in at least one end of said body;

said locking member having a support bar with a radially outwardly projecting bearing knob spaced from said internal bore to engage the inner wall surface of a pipe inserted in the bore;

a locking bar having one end pivotally attached to said support bar and extending substantially diametrically across said body, said locking bar being pivoted to swing



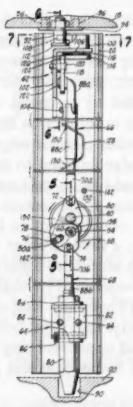
axially inwardly into the body and being biased outwardly therefrom;

the other end of said locking bar having retaining means for engaging the inner wall surface of a pipe inserted in said bore, at a position diametrically opposed to said bearing knob and said retaining means at its greatest diametrical extension, being spaced from said bearing knob at a distance greater than the internal diameter of the pipe, whereby a jamming action inside the pipe is provided between said retaining means and said bearing knob.

4,130,306
EXIT DOOR LOCKING MECHANISM HAVING MULTIPLE BOLTS

Ferdo Brkic, Los Angeles, Calif., assignor to Adams Rite Manufacturing Co., Glendale, Calif.

Filed Apr. 7, 1977, Ser. No. 785,687
Int. Cl.[2] E05C 9/02, 9/16
U.S. Cl. 292—5 **23 Claims**



1. A lock mechanism for an exit door having a tubular stile frame member extending along its swinging edge, and with top and bottom bolt mechanisms, comprising:

(a) lever means positioned in the tubular stile, including a pair of separate rotatably mounted levers;

(b) connecting rod structures in the stile respectively connecting said levers with the top and bottom bolt mechanism, the bottom bolt mechanism including a bolt mounted for reciprocable movement and the top bolt mechanism includes a fixed member on the frame and a horizontally swingable latch member mounted on the door to be engaged with said fixed member when the door is in a closed position, said latch member being swingable into a released position with respect to said fixed member to permit the door to be opened;

(c) a driving connection between said levers;

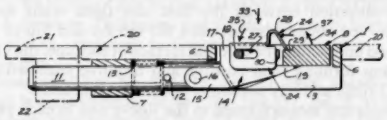
(d) said lever means being normally operative in one direction to axially move said rod structures away from each other to effect one operating condition of the bolt mechanisms; and

(e) manually operable means accessible from one side of the door for rotating one of said levers and the connected other lever of the levers as a unit in an opposite direction to axially move said rod structures towards each other to effect another operating condition of the bolt mechanisms.

4,130,307
PIN LATCH AND SAFETY LOCK THEREFOR

L. Richard Poe, Long Beach, and Raymond E. Harmon, Orange, both of Calif., assignors to Hartwell Corporation, Placentia, Calif.

Filed Nov. 4, 1977, Ser. No. 848,441
Int. Cl.[2] E05C 1/06
U.S. Cl. 292—179 **3 Claims**



1. A safety lock for pin latches of the type including a housing, a drive plate mounted in the housing for partial rotation, and connected through a linkage to a pin latch slidably movable between an extended position and a retracted position relative to the housing, the drive plate having a slot to receive a portion of the linkage, and having a portion in essentially coplanar relation with the linkage portion, the linkage and drive plate having confronting portions capable of relative angular movement on manual engagement, said safety lock comprising:

a. a channel shaped reciprocal means mounted on the linkage portion and capable of sliding movement with respect to the drive plate;

b. a locking element carried by the reciprocal means for movement between an extended position engagable with the other confronting portion to lock the drive plate and linkage against relative movement and a retracted position permitting such movement;

c. a spring urging the locking element toward its extended locking position;

d. said locking element being manually engagable to release the drive plate and linkage for further manual engagement to effect retraction to the pin latch.

4,130,308
MOTOR VEHICLE DOOR LATCHES

Philip S. Jeavons, Birmingham, England, assignor to Wilmot-Breeden Limited, Birmingham, England

Filed Aug. 16, 1977, Ser. No. 825,078
Int. Cl.[2] E05C 3/26
U.S. Cl. 292—216 **7 Claims**

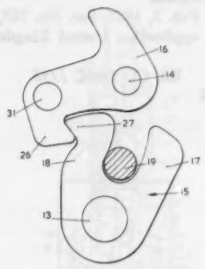
1. In a latch for the door of a motor vehicle comprising:

(A) a housing which includes front and back plates,

(B) a generally U-shaped bolt arranged for engagement with a striker and mounted on a first pivot pin extending between the two plates,

(C) a pawl arranged to co-operate with the bolt to hold it in its locking position, said pawl being mounted on a second pivot pin extending between the two plates,

(D) a plastics moulding mounted between the two plates, the plastics moulding including guide portions which are arranged to co-operate with the striker to guide it into engagement with the bolt and to obtain a wedging action during the final stages of relative movement between the striker and the bolt, and



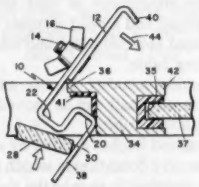
(E) an elastomeric block disposed within the housing and including a first part arranged to act on the striker to provide a throw-out action and a second part which provides support for one of the guide portions of the plastics moulding, the improvement wherein the first pivot pin passes through an aperture in said elastomeric block such that the elastomeric block provides a sound damping mounting for the bolt.

4,130,309

VENT WINDOW LOCK ASSEMBLY

Mary E. Lewis, 639 Maria Ave., Spring Valley, Calif. 92077

Filed Nov. 23, 1977, Ser. No. 854,154
Int. Cl.[2] E05C *17/54*
U.S. Cl. 292—258 **3 Claims**



1. A vent window lock assembly for securing a pivotable vent window having a vertical edge at one end to a vertical window post having a wing flange against which the end of the vent window resides when the window is closed, said assembly comprising

an S-shaped bracket defining opposed first and second overlapping channels wherein the first channel is adapted for gripping the vertical edge of the vent window, with the end portion of the bracket that defines the first channel being for positioning on the outside of the vent window, and the second channel is adapted for gripping the wing flange of the window post, with the end portion of the bracket that defines the second channel being for positioning on the inside of the window post;

a hook plate slidably fastened to the end portion of the bracket that defines the second channel, wherein one end of the hook plate extends away from the bracket and defines a hook for gripping the side of the window post opposite the wing flange; and

means for tightly fastening the hook plate to the bracket;

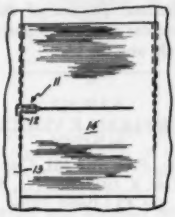
whereby the vertical edge of the vent window may be moved into the first channel of the bracket while the window is open and as the vent window is being closed while pivoting the end portion of the bracket defining the second channel about the window post; and the bracket can be secured to the window post after the window is so closed by sliding the hook plate until the hook grips the window post, and then tightly fastening the hook plate to the bracket.

4,130,310

ANTI-SEPARATION LATCHING APPARATUS

Lawrence R. Kessie, Strongsville, Ohio, assignor to Cleveland Hardware and Forging Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 690,410, May 27, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,512
Int. Cl.[2] E05C *1/06*
U.S. Cl. 292—340 **6 Claims**



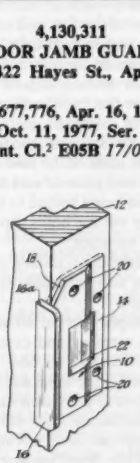
1. An anti-separation latch for a closure having a frame and a cover mounted for movement relative thereto between open and closed positions, comprising a striker mounted on said frame, and latch mechanism including a back plate mounted on said cover having a substantially right-angled and forwardly extending end flange engageable with the inner side of said striker when said cover is in closed position, a bolt longitudinally spaced from said end flange and slidable on said back plate, and spring means urging said bolt to extended position, the outer end of said bolt contacting said striker as said cover is moved toward closed position to retract said bolt against the action of said spring means, and said spring means moving said bolt into latching engagement with said striker when said cover is in closed position for preventing transverse opening movements thereof, whereby the engagement of said end flange and said inner side of said striker prevents relative longitudinal movement between said latch mechanism and said striker.

4,130,311

DOOR JAMB GUARD

Frank M. Sushan, 1422 Hayes St., Apt. 8, Hollywood, Fla. 33020

Division of Ser. No. 677,776, Apr. 16, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,604
Int. Cl.[2] E05B *17/00*
U.S. Cl. 292—346 **1 Claim**



1. A lock blocking device utilizable on a hinged door having a lock set, said door lock set having a retractable spring bolt

engageable into a guarded, interfitting-angled, striker catch plate in a door jamb, said bolt extending out of the free end face of said door, said door comprising:

a rigid planar plate mountable on the free end face of said door around said latch base plate, said plate including an aperture for receiving said lock bolt therethrough, said plate having a horizontal top edge, a first side edge, a second side edge parallel to said first side edge, and a horizontal bottom edge,

a lock guarding means connected integrally along said first side edge of said plate, said lock guarding means disposed adjacent and parallel to one side of said door and on both sides of said plate, said gaurding means having an upper horizontal portion, said plate including a downwardly disposed angular portion engageable at one end with the horizontal top edge of said plate and at its lower edge with the upper horizontal portion of said gaurding means whereby said angular upper edge portion of said plate acts as a drain for rain and the like.

4,130,312

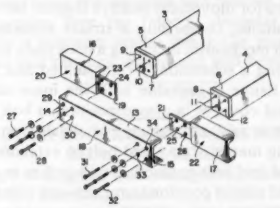
SECTIONED BREAKABLE VEHICULAR SAFETY BUMPER

Robert L. Cooper, Sr., P.O. Box 461, Clay City, Ky. 40312

Filed Dec. 8, 1977, Ser. No. 858,700

Int. Cl.[2] B60R *19/04*

U.S. Cl. 293—76 **1 Claim**



1. A safety bumper for a motor vehicle having a chassis with first and second spaced substantially parallel structural members extending along the length of the vehicle, each of the structural members of the chassis having a front end, said safety bumper comprising

a pair of square plates each affixed to the front end of a corresponding one of the first and second structural members of the chassis and each of the plates having a plurality of spaced holes formed therethrough;

a main metal bumper section affixed to and extending between the plates at the front ends of the first and second structural members, said main metal bumper section having spaced opposite first and second ends the first end being bolted to the plate of the first structural member via the holes through said plate of said first structural member and the second end being bolted to the plate of the second structural member via the holes through said plate of said second structural member;

a first plastic bumper section affixed to the plate of the first structural member and extending to one side of the main bumper section; and

a second plastic bumper section affixed to the plate of the second structural member and extending to the opposite side of the main bumper section, the first and second bumper sections being the same and being aligned with the main bumper section to provide a single bumper in appearance having a continuous front surface, each of the first and second bumper sections having a tongue extending therefrom behind the front surface thereof, said tongues having holes formed therethrough, and said first and second bumper sections being bolted to the plates of the first and second structural members, respectively, via the tongues thereof, said tongues being positioned behind the front surface of said main bumper section.

4,130,313

LIFTING DEVICES

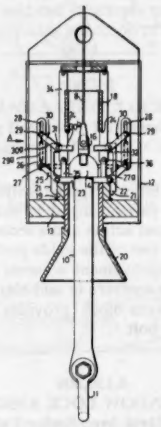
David F. Clifford, Walsall, England, assignor to Ansell Jones & Company Ltd., England

Filed Feb. 3, 1977, Ser. No. 765,316

Claims priority, application United Kingdom, Feb. 3, 1976, 4135/76

Int. Cl.[2] B66C *1/38*

U.S. Cl. 294—83 R **5 Claims**



1. In or for a pulley block, a latch mechanism for releasably securing a lifting element to the block comprising:

(a) a shaft having said lifting element at its lower end or means for the attachment of said lifting element, and having at its upper end a head member affording a downwardly presented abutment face and means for the attachment of a lifting cable;

(b) a vertical guide member having an open lower end through which said shaft can be moved longitudinally by means of said lifting cable;

(c) pivotally mounted latches carried by said guide member having an operative condition in which said latches extend into the guide member to engage the abutment face of said shaft and an inoperative condition in which said latches are withdrawn to allow downward passage of the shaft relative to said guide member;

(d) release means for displacing said latches from the operative condition to the inoperative condition comprising pivoted arms carried by the guide member at a position above the latches and linkage means connecting said pivoted arms and the latches for moving the latches to the inoperative condition in response to upward movement of the shaft relative to the guide member to bring the head member into contact with the pivoted arms; and

(e) means for restoring said latches to the operative condition.

4,130,314

PICKER AND LOADER FOR SOFT GOODS

Donald W. Storm, 5857 Upper Straits Blvd., Orchard Lake, Mich. 48033

Filed Aug. 25, 1977, Ser. No. 827,453

Int. Cl.[2] B25B *9/00*

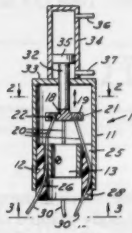
U.S. Cl. 294—100 **8 Claims**

1. A soft goods picker comprising:

a sleeve having an inner end and an outer end;

elongated, flexible wires extending through the sleeve and

through guide passages formed within the sleeve, said wires having inner ends connected to reciprocating means for moving the wires axially of the sleeve, with the wires being of sufficient length to extend outwardly of the outer sleeve end upon reciprocation in one direction and to be retracted within the sleeve upon reciprocation in the other direction;



said guide passages being angled so that each wire extends in a different direction outwardly of the outer end of the sleeve;

whereby the outer ends of said wires may penetrate and be withdrawn from a soft goods item for picking and moving such item.

4,130,315

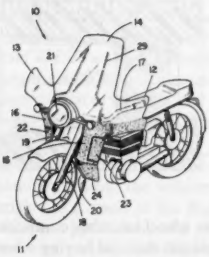
MOTORCYCLE FAIRING WITH VENT MEANS

William D. Shields, P.O. Box 672, R.R. 6, Lake Edgewood, Martinsville, Ind. 46151

Continuation-in-part of Ser. No. 658,036, Feb. 13, 1976, Pat. No. 4,010,976. This application Mar. 8, 1977, Ser. No. 775,633

Int. Cl.² B62J *17/02*

U.S. Cl. 296—78.1 **3 Claims**



1. A motorcycle fairing which comprises:

a formed sheet of transparent material, the formed sheet including first portions extending across and spaced apart from the front of the motorcycle handlebars, a second portion extending above the handlebars to shield the motorcycle rider's face, and third portions extending downwardly along opposite sides of the front fork of the motorcycle; and

vent means associated with at least one of the third portions for directing air toward the motorcycle and rider, said vent means comprising a vent panel and further comprising mount means for rotatably mounting the vent panel to one of the third portions, the third portion defining an opening within which the vent panel is rotatably received.

4,130,316

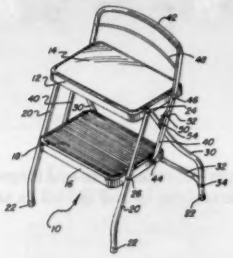
STEP LADDER/CHAIR COMBINATION

Joseph V. Rossi, Chicago, Ill., assignor to Comfort Lines, Inc., Chicago, Ill.

Filed Jan. 3, 1978, Ser. No. 866,485

Int. Cl.² A47C *4/00*

U.S. Cl. 297—46 **10 Claims**



1. A step ladder/chair combination comprising:

first and second platform means in spaced apart parallel relation for supporting a person/object at levels above the floor or other supporting surface;

a first pair of parallel legs pivotally interconnected to said first and second platform means on opposite sides thereof and depending downwardly of the lower platform means and having feet at their lower ends for supporting contact with said floor or other supporting surfaces;

a second pair of parallel legs pivotally connected to the upper platform means on said opposite sides thereof and depending downwardly with feet at their lower end for supporting contact with said floor or other supporting surface, said feet of said second pair of legs movable toward and away from said feet of said first pair of legs upon relative pivotal movement of said legs between a first position and a second position wherein said feet are spaced farther apart for supporting said step ladder/chair in a self-supporting standing condition on said floor or other supporting surface;

a third pair of parallel legs, parallel of said first parallel legs pivotally interconnected to said first and second platform means on said opposite sides thereof and extending upwardly above said upper platform means for supporting a back rest above said upper platform means;

a pair of linkage elements pivotally interconnected at opposite ends to pairs of adjacent second and third legs intermediate their length between said upper and lower platform means; and a pair of stops adjacent said linkage elements for limiting the relative pivotal movement between adjacent pairs of first and second legs to provide a stable, self-supporting condition of said step ladder/chair with said first and second platform means in spaced parallel relation to said floor or other supporting surface.

4,130,317

SUN-CUT GLASS CLAMPING DEVICE FOR AUTOMOBILES

Winston Lai, No, 42, I-Tung St., Taipei, Taiwan

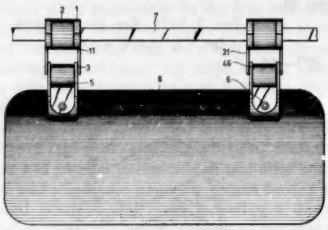
Filed Jul. 27, 1977, Ser. No. 819,334

Int. Cl.² B60J *3/02;* **A44B** *21/00*

U.S. Cl. 296—97 R **3 Claims**

1. A device for attachment to an automobile visor for reducing sun glare comprising tongue means having separable top and bottom sections which overlie an edge of the visor, said top section provided with at least two holes, said bottom section having at least two protuberant points which register with the two holes of said top section when said tongue means engages a visor, a first U-shaped spring clip adapted to pressure said top and bottom sections together so as to retain said tongue means on said visor, clamping arm means attached to a

sun reducing glass having a second spring clip, and means connecting said tongue means with said clamping arm means,



including a carrier depending from said tongue means, a fixing shaft fastened to said carrier and carried on said clamping arm means.

4,130,318

HEADREST WITH SIDE PADS

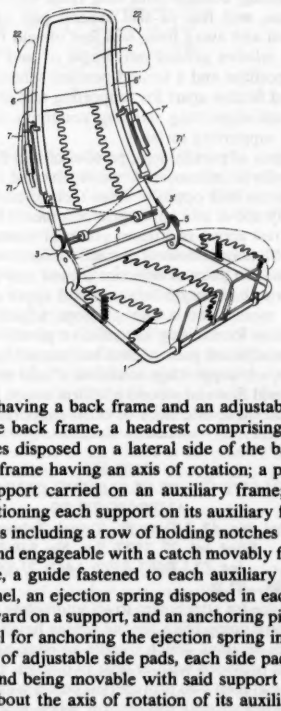
Marcel Hemmen, Franconville, and Jacky Heron, Suresnes, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 9, 1978, Ser. No. 868,215

Claims priority, application France, Jan. 12, 1977, 77 00703

Int. Cl.[2] A47C *1/10*

U.S. Cl. 297—410 **1 Claim**



1. In a seat having a back frame and an adjustable cushion attached to the back frame, a headrest comprising: a pair of auxiliary frames disposed on a lateral side of the back frame, each auxiliary frame having an axis of rotation; a pair of supports, each support carried on an auxiliary frame; adjusting means for positioning each support on its auxiliary frame, said adjusting means including a row of holding notches located on each support and engageable with a catch movably fixed to the auxiliary frame, a guide fastened to each auxiliary frame and having a channel, an ejection spring disposed in each channel and acting upward on a support, and an anchoring pin disposed in each channel for anchoring the ejection spring in the channel; and a pair of adjustable side pads, each side pad mounted on a support and being movable with said support vertically, or angularly about the axis of rotation of its auxiliary frame; whereby adjustment of the auxiliary frames and adjusting means permits the side pads to be positioned out of the lateral field of vision of the person occupying the seat.

4,130,319

MINING MACHINES

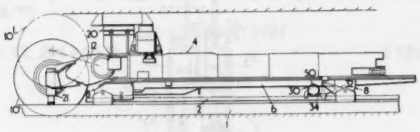
Terence J. Gapper, Duffield, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Mar. 4, 1976, Ser. No. 663,785

Claims priority, application United Kingdom, Mar. 25, 1975, 12386/75

Int. Cl.[2] E21C *35/08*

U.S. Cl. 299—1 **12 Claims**



1. A mining machine which in use traverses to and fro along a track comprising a body adapted to be hauled to and fro, a number of shoes supporting the body and movable along the track, and equipment mounted on one shoe for sensing the position of the machine along the track, the equipment comprising an arm connected to the one shoe, a pin connected to the arm remote from the shoe and transverse to the track, a link mounted for rotation on the pin, a roller on the link drivably engageable with the track and means for sensing the number of rotations of the roller and for deriving a signal indicative of the number of rotations.

4,130,320

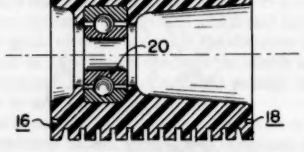
WHEEL FOR ROLLER SKATE OR SKATEBOARD

Anthony Scardenzan, 269 N. Hillcrest Blvd., Inglewood, Calif. 90301

Continuation-in-part of Ser. No. 628,048, Nov. 3, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,789

Int. Cl.[2] A63C *17/22*

U.S. Cl. 301—5.7 **2 Claims**

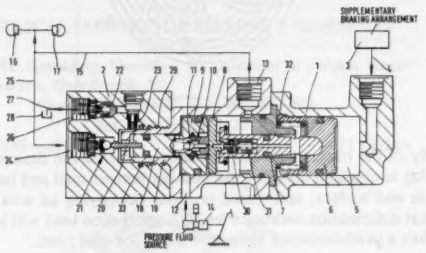


1. A roller skate wheel assembly comprising: a wheel formed of one piece of plastic material having a bore extending therethrough with a pair of axially spaced annular shoulders formed on the bore surface, and having a series of spaced grooves extending around the outer peripheral surface of the wheel to define a corresponding series of surface-gripping ribs, and having at least one further groove formed in at least one end thereof adjacent to said peripheral surface to permit the outer edge of the wheel to turn radially inwardly when the assembly is in use; at least one bearing embedded in the bore of said plastic wheel between said annular shoulders and contained in said bore in concentric relationship therewith, the wheel extending axially beyond both ends of the bearing with the extension beyond the outer end of the bearing being substantially greater than the extension beyond the inner end of the bearing, and the peripheral surface of the wheel having a concave configuration.

4,130,321
PRESSURE-REGULATING VALVE FOR VEHICULAR BRAKING SYSTEMS

Franz Fleck, Frankfurt-Nied, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,006
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635154
Int. Cl.[2] B60T 7/00
U.S. Cl. 303—13 4 Claims



1. An improvement to a pressure-regulating valve for vehicular braking systems, said pressure-regulating valve being inserted between a brake-pedal-controlled pressure-fluid source and a plurality of wheel brake cylinders, said pressure-regulating valve including a housing portion having a longitudinal axis; a piston disposed within said housing portion coaxial of said axis in communication with a supplementary braking arrangement; a shifting device disposed within said housing portion coaxial of said axis and fastened to said piston remote from said supplementary braking arrangement; a plunger piston disposed within said housing portion coaxial of said axis; an auxiliary piston disposed within said shifting device coaxial of said axis and in a controlling relationship with said plunger piston, said auxiliary piston being displaceable in a direction away from said plunger piston against a force of a spring; and a pressure chamber disposed within said housing adjacent said plunger piston in communication with said brake-pedal-controlled pressure-fluid source and said plurality of wheel brake cylinders; said plunger piston having a pressure-fluid passageway therein disposed coaxial of said axis and a closure member for said passageway, said passageway communicating said brake-pedal-controlled pressure-fluid source with said pressure chamber, said closure member being movable into an open position by said axuiliary piston; the volume of said pressure chamber being variable as a result of the displacement of said plunger piston into an end position by said piston, said shifting device and said auxiliary piston; said displacement being dependent on the braking action of said supplementary braking arrangement; said improvement comprising:

a housing block sealed to and seated on said housing portion;

a seat valve disposed in said housing block coaxial of said axis and disposed in a connection between said plurality of wheel brake cylinders and a reservoir;

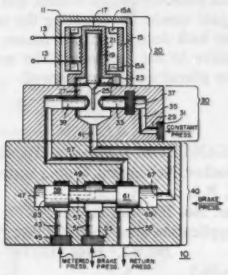
a tappet secured to said plunger piston to push said seat valve open in said end position of said plunger piston; and

a pressurizing valve disposed in said housing block in a parallel relationship with said seat valve and disposed in said connection, said pressure-regulating valve operating such that said seat valve is controlled by the location of said tappet acted upon by pressure from said supplementary braking arrangement and brake-pedal-controlled pressure-fluid source.

4,130,322
SINGLE GAIN SKID CONTROL VALVE AND SKID CONTROL SYSTEM

Robert D. Cook, Valencia, Calif., assignor to Crane Co., New York, N.Y.

Division of Ser. No. 742,251, Nov. 16, 1976, Pat. No. 4,053,187.
This application Oct. 7, 1977, Ser. No. 840,417
The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.
Int. Cl.[2] B60T 8/02
U.S. Cl. 303—93 11 Claims



1. A vehicle braking control system comprising:

braking control circuit including a valve driver for providing an electrical braking signal;

means for providing a supply of hydraulic fluid at substantially constant pressure;

means for providing hydraulic fluid at variable metered pressure;

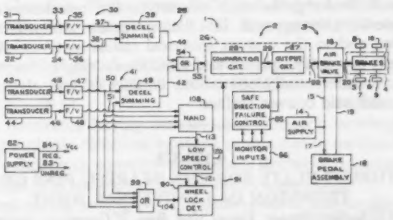
control means for accepting said constant pressure hydraulic fluid and for providing a hydraulic control output in response to said braking control circuit, said hydraulic control output being exclusively controlled by said electrical braking signal; and

brake pressure valving means selectively responsive to said metered pressure and said hydraulic control output for producing a brake pressure output which is limited by said hydraulic control output.

4,130,323
TANDEM CONTROL BRAKE SYSTEM

Yudh V. Rajput, Dayton, and Carl A. Couchot, Piqua, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 19, 1977, Ser. No. 817,459
Int. Cl.[2] B60T 8/02
U.S. Cl. 303—106 15 Claims



1. In an anti-skid brake control system for overriding manual operation of the brakes of a vehicle having plural wheels on each of plural axles, including transducer means for monitoring the speeds of such plural wheels, and output means responsive to the wheel speeds detected by the transducer means for controllably dumping a percentage of the brake operating fluid pressure requested by the vehicle operator, the improvement comprising:

a single wheel lock detector circuit means coupled between the transducer means and the output means for detecting the locking of any of the monitored wheels to operate the output means to effect such overriding in response to detection of such wheel locking, said wheel lock detector circuit means including disabling means for ordinarily disabling said wheel lock detector means when the vehicle speed drops below a predetermined minimum speed and threshold amplifier means for producing a wheel lock signal to effect such overriding when the speed of any of the monitored wheels drop below a predetermined minimum speed and said disabling means has not disabled said wheel lock detector circuit means, and further comprising NAND gate means for coupling the transducer means to said wheel lock detector circuit means, whereby the latter is responsive to the locking of the most slowly rotating one of the plural wheels monitored.

4,130,324

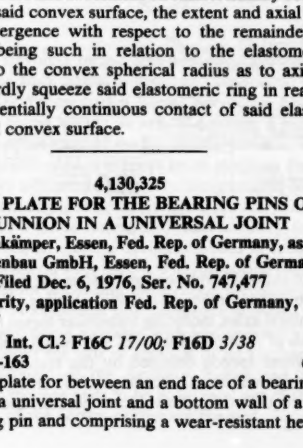
SEAL MEANS FOR A SELF-ALIGNING BEARING

Manfred E. Becker, Newington, Conn., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 758,402, Jan. 11, 1977, Pat. No. 4,089,095. This application Jan. 16, 1978, Ser. No. 869,590

Int. Cl.[2] F16C *33/74*

U.S. Cl. 308—36.1 **13 Claims**



1. A self-aligning bearing comprising an inner member having a spherical convex outer surface and an outer-ring member having a concave inner surface at sliding interface engagement with said convex surface, said outer-ring member having an undercut counterbore at one axial end, the axially outer end of the undercut counterbore being characterized by a surface of revolution which converges radially toward said spherical surface as a function of axially outerward location along the counterbore, and an elastomeric ring compressionally retained in the counterbore and in resilient circumferentially continuous contact with said convex surface, the extent and axial location of such convergence with respect to the remainder of the counterbore being such in relation to the elastomeric-ring section and to the convex spherical radius as to axially and radially inwardly squeeze said elastomeric ring in reaction to the circumferentially continuous contact of said elastomeric ring with said convex surface.

4,130,325

THRUST PLATE FOR THE BEARING PINS OF A TRUNNION IN A UNIVERSAL JOINT

Josef Schultenkämper, Essen, Fed. Rep. of Germany, assignor to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

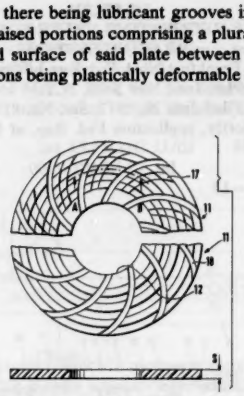
Filed Dec. 6, 1976, Ser. No. 747,477

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555667

Int. Cl.[2] F16C *17/00*; F16D *3/38*

U.S. Cl. 308—163 **6 Claims**

1. A thrust plate for between an end face of a bearing pin of a trunnion in a universal joint and a bottom wall of a bushing on the bearing pin and comprising a wear-resistant heat-stable plastic material, there being lubricant grooves in a surface of said plate, and raised portions comprising a plurality of protuberances on said surface of said plate between said grooves, said raised portions being plastically deformable during assembly of the bushing on the bearing pin so that the desired end play is obtained between the bushing bottom wall and bearing pin end surface, said raised portions occupying an area such that deformation resistance under compression load will be less than a predetermined resistance value for said plate.



4,130,326

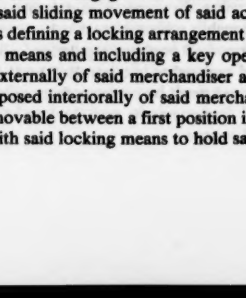
CIGARETTE MERCHANDISER

Richard P. Hornblad, Shorewood, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed Sep. 9, 1977, Ser. No. 831,893

Int. Cl.[2] A47F *3/024*; A47B *81/00*

U.S. Cl. 312—292 **9 Claims**



1. A merchandiser as described comprising, in combination,

means defining a plurality of spaced apart bins,

housing means defining an enclosure for said bins,

a plurality of access doors,

means supporting said access doors on said housing means with one of said access doors positioned in registry with each of said spaced apart bins and also for sliding movement relative to said bins so that said access doors are selectively movable to close said bins and open said bins for access from the exterior of said merchandiser,

locking means comprising a plurality of locking fingers and supported on said housing means, said locking fingers being mechanically interconnected so that all of said locking fingers are jointly movable selectively between a first position wherein said locking fingers are each engaged with a respective one of said access doors and a second position free of engagement from said access doors to permit said sliding movement of said access doors,

and means defining a locking arrangement connected to said locking means and including a key operated portion exposed externally of said merchandiser and a locking portion disposed interiorally of said merchandiser and selectively movable between a first position in locking engagement with said locking means to hold said locking fingers

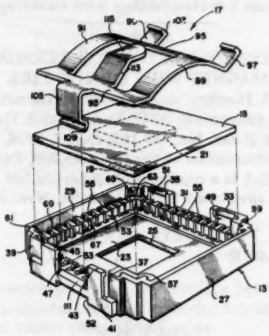
in said first position and a second position out of engagement with said locking means and freeing said locking fingers for sliding movement to said second position, wherein each of said access doors includes means defining a notch projecting into the interior of said merchandiser when said main door is in its closed position, and said locking fingers comprise a plurality of tabs selectively engageable in respective ones of said notches when said locking fingers are in said first position and free of said notches when said locking fingers are in said second position.

4,130,327

ELECTRICAL CONNECTOR HAVING A RESILIENT COVER

Tedford H. Spaulding, Norridge, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed May 27, 1977, Ser. No. 801,094
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 CF **17 Claims**



1. An electrical connector for supporting and for completing electrical connections to an integrated circuit device mounted on a flat substrate, said connector comprising:

base means having outer walls and an interior peripheral shoulder providing upward facing support surfaces for engaging said substrate;

said base means having hinge lug means on one of said outer walls and means at another outer wall opposite said one outer wall for engaging a catch, said hinge lug means comprising first and second hinge lugs spaced apart to correspond to the spacing between first and second arcuate portions of a resilient cover means, each of said hinge lugs having a slot extending therethrough to define a top hinge lug member above said slot; and

resilient cover means comprising first and second longitudinally extending arcuate portions having respective opposed ends and at least one laterally-extending connecting portion joining said first arcuate portion and said second arcuate portion in parallel spaced relation,

each of said arcuate portions having a corresponding hinging portion at one end thereof adapted to engage said hinge lug means, said hinging portions extending rearwardly from said first and second arcuate portions through a corresponding one of said slots in said first and second hinge lugs;

said cover means further having a latching portion extending forwardly from said connecting portion, said latching portion having catch means adapted to engage said catch engaging means in said opposite wall;

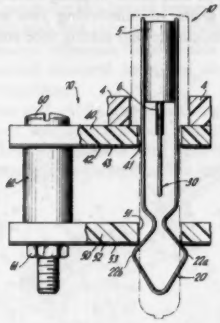
said cover means being pivotable about said hinge lug means to a closed position wherein said catch means cooperates with said catch engaging means to secure said cover means in the closed position and in which the ends of said arcuate portions contact said substrate and press said substrate down onto said support surfaces.

4,130,328

MULTI LEVEL PROGRAMMING ASSEMBLY

Kenneth Wessel, White Plains, N.Y., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,895
Int. Cl.[2] H01R *29/00*
U.S. Cl. 339—18 C **14 Claims**



1. A contact pin for connecting a plurality of printed circuit boards in a spaced apart multi-level relationship, said printed circuit board having a plurality of columns and rows of apertures, said contact pin comprising:

an enlongated hollow shell member, formed from a nonconductive material having a body portion and a probe portion for insertion into an aperture of a printed circuit board, said probe portion including a plurality of spaced apart through slots; and

a plurality of conductive, resilient contacts disposed within said shell member, each contact being substantially diamond shaped in configuration, having spaced apart corner members, said corner members of each contact being on opposite edges of said diamond configuration, said contacts being disposed at a predetermined angle relative to each other, said angle being equal to or less than 90°, but large enough to avoid electrical interference among said contacts, the corner members on opposite edges of each said contact being received in and protruding through the through slots of the probe portion.

4,130,329

ELECTRICAL CONNECTOR ASSEMBLY RETENTION SYSTEM

Curtis S. Chandler, Walkertown, N.C., and Ralph L. Miller, Kernersville, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 6, 1977, Ser. No. 840,349
Int. Cl.[2] H01R *13/54, 13/58*
U.S. Cl. 339—75 M **3 Claims**

1. In a connector having intermatable dielectric housings containing multiple electrical contacts terminated to insulated electrical conductors, together with means latchably retaining said housings intermated, the improvement comprising:

a resilient spring having two elongate resilient fingers connected by an integral bight, the fingers having thickened tips at the free ends thereof initially biased resiliently toward each other,

said tips having convex edges bent outwardly of the planes of said fingers to project toward each other perpendicular to the planes of the fingers,

one said connector housing having a central cavity defined by elongate parallel sidewalls connected by integral end walls, said sidewalls having apertures therein communicating with said central cavity,

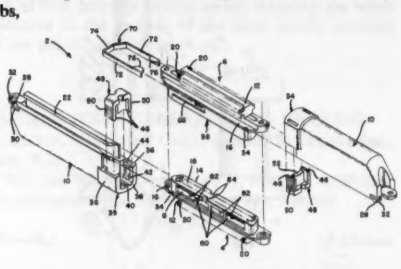
said fingers being impinged along said sidewalls with said tips received in said apertures and protruding into said cavity,

the other of said housings having a portion which is pluggable within the first housing central cavity,

said other housing having a mating face provided with a central cavity containing multiple electrical contacts matable with contacts contained in said first housing,

said other housing having elongate sidewalls connected by end walls perpendicular of said mating face,

said sidewalls of said other housing having recesses therein defining a series of reinforcing ribs and also undercut shoulders proximate said mating face and intersecting said ribs,



said mating face having chamfered surfaced recesses in corresponding sidewalls intersecting corresponding shoulders,

said recesses being aligned with said contact edges of said tips when said housings are intermated, whereby said chamfered surfaces resiliently bias said tips outwardly of said central cavity upon receipt of said mating face within said central cavity, and

said tips being in registration within corresponding recesses with said convex edges in locked registration under said undercut shoulders thereby maintaining said housings in intermated condition.

4,130,330

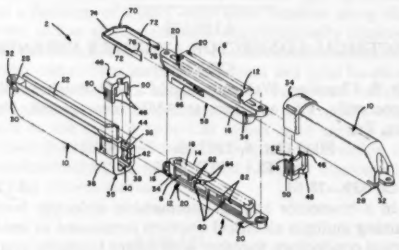
ELECTRICAL CONNECTOR STRAIN RELIEF AND COVER RETENTION SYSTEM

Curtis S. Chandler, Walkertown, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 6, 1977, Ser. No. 840,350

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—75 M **2 Claims**



1. In a connector having intermatable dielectric housings containing multiple electrical contacts terminated to insulated electrical conductors, together with means latchably retaining said housings intermated, the improvement comprising:

elongated grooves defined between a wire terminating portion of each said housing and a corresponding outwardly projecting flange separating said wire terminating portion from a mating side,

a cable having a plurality of individual conductors terminated to corresponding electrical contacts contained in each said wire terminating portion,

a cover for each said housing having an elongate opening on one side and one opened end receiving a corresponding cable therethrough,

each said cover having a pair of ribs projecting into said opening from opposite sides thereof and slottably received in said grooves, thereby mounting said cover over a corresponding wire terminating portion,

an extension portion integral with each cover having a pair of arms receiving a corresponding cable therebetween,

each said arms being provided with ratchet teeth defining undercut shoulders,

a bight portion integrally connecting each said pair of arms and provided with a projecting rib impinging a corresponding cable lengthwise thereof,

a plug inserted between each said pair of arms and having depending resilient tabs provided with ratchet teeth defining shoulders latchably secured to said undercut shoulders of said each pair of arms,

said plug being ratcheted into compression of said cable against said rib,

said rib indenting said cable, and

said plug projecting outwardly from said arms and overlying an end of a corresponding cover to prevent removal thereof from a corresponding wire receiving portion.

4,130,331

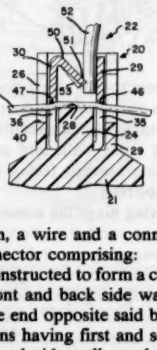
SOLDERLESS CONNECTOR FOR TERMINATING A MAGNET WIRE OR THE LIKE

Nelson E. Neff, Hershey, and Anthony F. Thomas, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 749,185, Dec. 9, 1976, abandoned, which is a continuation of Ser. No. 643,209, Dec. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 547,318, Feb. 5, 1975, abandoned. This application Nov. 14, 1977, Ser. No. 852,004

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—97 R **2 Claims**



1. In combination, a wire and a connector for terminating said wire, said connector comprising:

housing means constructed to form a contact retaining structure having front and back side walls, a bottom surface, and open at the end opposite said bottom surface;

said housing means having first and second slots formed in said front and back side walls, each with an open end and a closed end and with said open end extending down said front and back side walls from said open side thereof;

said housing means further comprising an anvil-like wire supporting means extending upwardly from said bottom surface to about the level of the closed ends of said first and second slots and positioned between said front and back side walls;

said wire being inserted in said first and second slots and laying across said wire supporting means;

terminal means comprising a U-shaped conductive member having first and second plate-like legs with first ends thereof connected together by a connecting transverse section and having third slot means extending across the center of said connecting transverse portion to divide said transverse portion into two sections and further extending down into said first and second legs thereof as fourth and fifth slots;

said terminal being inserted in said contact retaining structure with the two sections of said transverse portion facing the bottom surface of said housing means and straddling

said anvil-like wire supporting means, and with said fourth and fifth slots in said first and second legs thereof being aligned in an inverted position with respect to said first and second slots to trap the inserted wire end between the closed ends of said first and second slots and said fourth and fifth slots; and

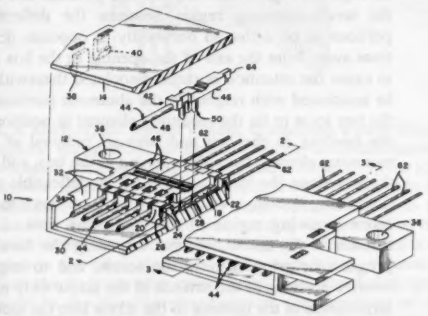
at least one of said first and second slots and at least one of said fourth and fifth slots having a width slightly narrower than the diameter of said wire.

4,130,332

MODULAR CONNECTOR AND CRIMP ARRANGEMENT FOR MAGNETIC WIRE

John C. Asick, Harrisburg; Clifton W. Huffnagle, Camp Hill; Michael S. Peppler, Lancaster, and John A. Woratyla, Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 24, 1978, Ser. No. 889,756
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—97 P **5 Claims**



1. A connector providing an interface between wires of a plurality of magnetic coils in a multi-dot matrix print head and conventional cables comprising:

a housing having a base member and a mating cover defining a cavity therebetween, said base member having a plurality of parallel spaced channels extending transversely across said cavity and defining a comb-like configuration in front and rear walls thereof, and means for latchingly securing said cover on said base; and

a plurality of terminal modules, each said module including a terminal mounted in a rigid block of insulation material, each said terminal having a first mating portion profiled for mating with a further terminal and a conductor engaging second portion having a plurality of tines defining insulation displacing slots between adjacent pairs of tines, said modules being received in respective channels in said base member with the slots between the tines engaging conductors laid in said channels to form an electrical and mechanical engagement therewith.

4,130,333

QUICK CONNECT ELECTRICAL PLUG

Marijan Djurinec, Acton, Canada, assignor to Smith & Stone Limited, Toronto, Canada

Filed Mar. 6, 1978, Ser. No. 884,350
Claims priority, application Canada, Nov. 15, 1977, 290952
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—97 P **1 Claim**

1. A quick-connect electrical plug for use with a two-conductor insulated cord said plug comprising:

(A) first and second housing members, said housing members having groups of associated and opposed apertures, paired recesses and cavities to form an assembly;

(a) a cord receiving slot, terminating at an outer surface of said plug;

(b) first and second terminal receiving slots each disposed substantially perpendicularly to said cord receiving slot, said terminal receiving slots terminating at an outer surface of said plug;

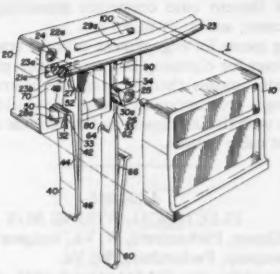
(c) first and second terminal retainer means within the interior of housing members, each retainer means being disposed adjacent to an associated one of said terminal receiving slots;

(d) a spike-receiving recess in said cord receiving slot in said first housing disposed in line with the first of said terminal receiving slots and a spike-receiving recess in said cord receiving slot in said second housing disposed in line with said second terminal receiving slot;

(e) a wedged-shaped recess in said cord receiving slot in said first housing disposed in line with said second terminal receiving slot and a wedge-shaped recess in said cord receiving slot in said second housing disposed in line with said first terminal receiving slot, and

(B) first and second terminals for slideable reception in said first and second terminal receiving slots, each of said terminals comprising:

(i) a short tine and a long tine joined together at adjacent ends thereof, said adjacent ends constituting a blade for insertion into a receptacle, said tines being urged apart at the opposite ends thereof by the inherent springiness



of the material of which the contacts are made, the longer of said tines terminating with a first spike at said opposite end thereof, said spike being positioned to penetrate the insulation and conductor of one of said conductors in said cord and to enter said spike receiving recess, said longer tine also including a cable clamping portion adjacent said spike, said cable clamping portion being positioned to abut the insulation around the other of said conductors, and to deform said conductor into said associated wedge-shape recess, the shorter of said tines having an ear formed thereon, said ear abutting said terminal retaining means when the associated said terminal is slid outwardly of said housing members, the said short tine further including a resilient detent, said detent snapping behind said terminal retaining means when the said terminal is slid into insulation and conductor piercing relationship with the said cord, the said first and second terminals being permanently locked into the said first and second housing members after insertion of said first and second terminals.

4,130,334

GROUND TERMINATION AND STRAIN RELIEF CONNECTOR MEANS

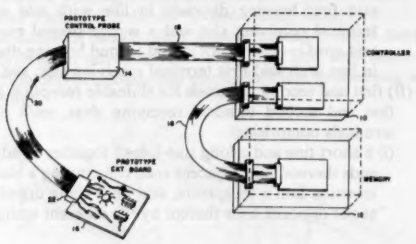
Brent W. Anderson, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 3, 1977, Ser. No. 839,144
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—103 M **8 Claims**

1. A ground termination and strain relief connector means for use in connection with flat cable means having a plurality of signal conductor means covered by insulation means and isolated from each other thereby and shielding conductor means extending along the signal conductor means and isolated therefrom by the insulation means but covered thereby, said connector means comprising:

termination plate means having a termination area for positioning an exposed section of the shielding conductor means and means provided along said termination area for connecting the exposed section of the shielding conductor means to said termination plate means;

mounting means provided by said termination plate means for mounting said termination plate means and the flat cable means with the shielding conductor means con-



nected thereto onto connector mounting means of an instrument; and

clamping means for engagement with the connector mounting means for clamping said termination plate means and flat cable means thereon onto the instrument thereby forming a ground connection of the shielding conductor means with the instrument and to provide strain relief for the flat cable means.

4,130,335

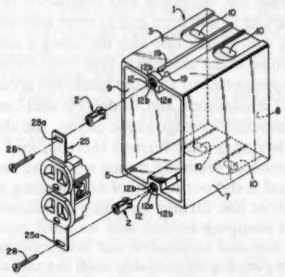
ELECTRICAL WIRING BOX

David W. Kinney, Parkersburg, W. Va., assignor to Union Insulating Company, Parkersburg, W. Va.

Continuation of Ser. No. 712,514, Aug. 9, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,112

Int. Cl.[2] H02G 3/16

U.S. Cl. 339—122 R **13 Claims**



1. A box arrangement comprising:

a box including a plurality of walls arranged to define a space for receiving a device, said box having a longitudinal opening therein in which a mounting element is disposed and further having a pair of abutment portions adjacent to opposite sides of the opening;

said mounting element comprising:

a central portion adjacent to the front of the opening in the box and having a portion in abutment with a portion of the box adjacent to the opening, said central portion having an opening associated therewith by which a threaded screw may be inserted into the mounting element, said opening in the central portion being of a size to permit a screw to be freely and readily inserted into the mounting element without the central portion interfering with the forward progress of the screw or gripping onto the screw;

first and second spaced-apart side portions connected with the central portion on opposite sides of the opening associated with the central portion and extending along the opening in the box, said side portions being spaced apart to define an unobstructed region therebetween for allowing a screw inserted into the mounting element and pushed longitudinally through the region between the side portions to pass continuously and unobstructively through the region without the side portions engaging the screw; and

first and second deflectible portions respectively connected with the first and second side portions and having first and second retention portions respectively associated therewith adjacent to the abutment portions of the box, said deflectible portions having threads provided along inner surfaces thereof and defining a screw-receiving region therebetween, said deflectible portions being operative when a screw is inserted and pushed longitudinally into the mounting element through the region between the side portions and into the screw-receiving region between the deflectible portions to be deflected outwardly in opposite directions away from the axis of the opening in the box and to cause the retention portions associated therewith to be positioned with respect to the abutment portions of the box so as to fix the mounting element in position in the opening in the box and prevent removal of the mounting element from the opening in the box, and the threads along the inner surfaces of the deflectible portions being operative when the screw is pushed into the screw-receiving region to ride along the rims of the threads of the screw, without impeding the forward progress or gripping onto the screw, and to engage interior portions of the threads of the screw only upon termination of the pushing of the screw into the mounting element.

4,130,336

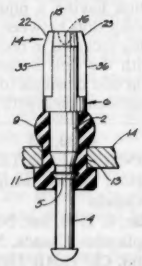
BINDING POST TERMINAL

Hilliard Dozier, Morrow, Ohio, assignor to U.S. Terminals, Inc., Cincinnati, Ohio

Filed Jun. 20, 1977, Ser. No. 808,076

Int. Cl.[2] H01R 9/14

U.S. Cl. 339—273 R **7 Claims**



1. In an electric terminal having a conductive terminal pin with a binding post at one end, said binding post comprising a cylindrical body having an inwardly tapered annular shoulder terminating in a planar top, an annular recess extending inwardly from said planar top, a vertically disposed arcuate slot extending downwardly through said tapered shoulder and said recess into said cylindrical body, the inner and outer surfaces of said slot being defined by arcs of a pair of concentric circles having their axes parallel to the longitudinal axis of the binding post.

4,130,337
HOLOGRAPHIC VIEWER SYSTEM

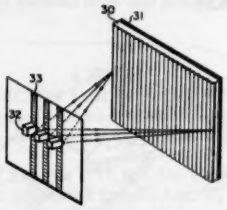
Takanori Okoshi, No. 7-7, 3-chome, Sengoku, Bunkyo-ku, Tokyo, Japan

Continuation of Ser. No. 760,024, Jan. 17, 1977, abandoned, which is a continuation of Ser. No. 553,086, Feb. 26, 1975, abandoned, which is a continuation of Ser. No. 412,643, Nov. 5, 1973, abandoned, which is a continuation of Ser. No. 134,177, Apr. 15, 1971, abandoned. This application Oct. 13, 1977, Ser. No. 841,719

Claims priority, application Japan, Apr. 21, 1970, 45-33634; Dec. 30, 1970, 45-122855

Int. Cl.[2] G03H *1/30*

U.S. Cl. 350—3.76 23 Claims



1. A holographic viewer system, comprising a strip shaped elongated holographic element containing three-dimensional information and containing parallax information along the long dimension, means for directing a reconstructing beam onto the holographic element to form an image beam, a screen in the path of the image beam, said screen being constructed so that light incident thereon is diffused in one direction and autocollimated in the other direction, said screen being oriented to diffuse the light on the image beam from the holographic element in the direction transverse to the direction of the parallax information and to autocollimate the light in the image beam in the direction of the parallax information.

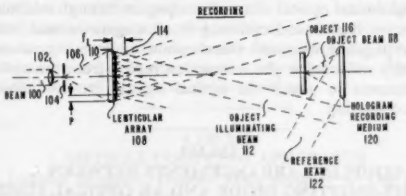
4,130,338
HOLOGRAM HAVING EXPANDED VIEWING AREA

Burton R. Clay, Wayland, and Douglas A. Gore, Billerica, both of Mass., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 714,360, Aug. 16, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,761

Int. Cl.[2] G03H *1/16, 1/32*

U.S. Cl. 350—3.82 5 Claims



1. A method for directly viewing over an expanded image viewing area the reconstructed image of a holographically recorded object played back with a readout beam of light of preselected wavelength; said method comprising the steps of:

holographically recording said object with a set of diverging object illuminating beams of coherent light of given wavelength respectively derived from an array of spaced point sources of light distributed at a first pitch distance over a given area, every one of said object illuminating beams illuminating said entire object,

playing back said holographically recorded object with said readout beam to derive a set of background first diffraction order beams of light that individually converge to a multiplicity of spaced background term convergence points corresponding to said array of point sources, said multiplicity of background term convergence points being distributed at a second pitch distance which is determined by said first pitch distance and the ratio of said preselected to said given wavelengths, and

specifying said first pitch distance at a value at which said second pitch distance is less than the diameter of the pupil of the light-adjusted eye of an observer,

whereby each background term convergence point constitutes a separate valid eye point of an expanded image viewing area, and an individual image of said object is directly viewable by the eye of an observer in proximity to any valid eye point.

4,130,339
SCANNING OPTICAL SYSTEM INCLUDING AN OPTICAL SYSTEM FOR DETECTING AN INFORMATION BEAM

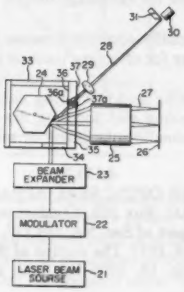
Naoto Kawamura, Inagi; Kazuya Matsumoto, and Takashi Kitamura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1977, Ser. No. 776,894

Claims priority, application Japan, Mar. 16, 1976, 51-28494; Mar. 19, 1976, 51-30492

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.8 11 Claims



1. A scanning optical system comprising:

a light source emitting a beam used for scanning;

a deflecting device for deflecting the beam emitted from said light source to scan in a predetermined direction;

a first focusing lens for focusing the deflected beam from said deflecting device onto a scanning plane;

an optical system disposed between said first focusing lens and said deflecting device for reflecting a portion of the beam from said deflecting device a plurality of times within the optical system so as to take up said portion of the beam as an information beam; and

a second focusing lens for focusing the information beam.

4,130,340
TWO-SPEED TELESCOPE FOCUSING MECHANISM

J. Peter E. Kooi, Succasunna, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Jul. 13, 1977, Ser. No. 815,126

Int. Cl.[2] G02B *7/10*

U.S. Cl. 350—79 7 Claims

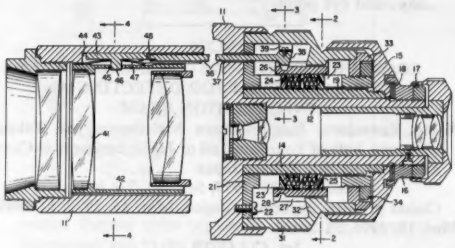
1. In a telescope including an internal draw tube mounting a focusing lens and being displaceable longitudinally of said telescope to effect the focus of the image of a scene under observation, the improvement which comprises a two-speed focusing mechanism comprising:

(a) a threaded sleeve member journaled for rotation about the line of sight of said telescope, the threads being situated on the external circumference of said sleeve member and being of multiple lead configuration;

(b) a threaded drive ring member disposed concentrically

about said sleeve member for rotation about said line of sight, the threads being situated on the internal circumference of said ring member and being of a configuration comprising a lesser number of leads than that of said sleeve member;

(c) a plurality of threaded drive block members interposed between and in threaded engagement with the respective threaded surfaces of said sleeve and ring members, said block members being constrained to movement substantially parallel to said line of sight;



(d) first manually-accessible means associated with said sleeve member for effecting rotation of said sleeve member;

(e) second manually-accessible means associated with said drive ring member for effecting rotation of said ring member; and

(f) means coupling said drive ring member with said draw tube for effecting said focusing draw tube displacement with longitudinal displacement of said drive ring.

4,130,341

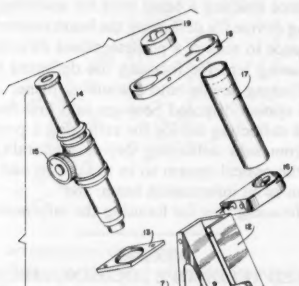
FIBER OPTIC SEAL APPARATUS

Lorin R. Stieff, P.O. Box 263, Kensington, Md. 20795

Continuation-in-part of Ser. No. 733,177, Oct. 18, 1976. This application Feb. 14, 1977. The portion of the term of this patent subsequent to Aug. 15, 1995 has been disclaimed. Ser. No. 768,434

Int. Cl.[2] G02B *5/16*

U.S. Cl. 350—96.20 **12 Claims**



1. Fiber optic seal apparatus comprising a block, first and second pathways crossed within the block, the pathways having fiber bundle receiving openings and fiber end holding openings in spaced relationship on facial areas of the block, bundle holding means connected to the block for holding an optic fiber bundle end inserted in each pathway with portions of the fibers near one end of the bundle threaded between portions of the fibers near the opposite end of the bundle in random arrangement within the block and fiber directing means mounted within the block, and facial collet means having rectangular openings for holding the ends of fibers in tight rectangular configuration.

4,130,342

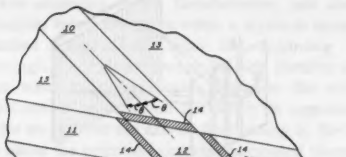
PASSIVE OPTICAL CHANNEL CROSSOVER, SWITCH AND BEND STRUCTURE

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,661

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.14 **25 Claims**



1. An optical channel in-plane crossover comprising:

a plate of substantially transparent optical material having a refractive index N_1;

means for forming an optical channel configuration in said plate comprising first and second optical channels each with a refractive index n that is greater than N_1 such that optical signals with diverging angles between $-\theta$ and $+\theta$ with respect to the direction of said optical channels propagate therein, said first and second optical channels crossing at a predetermined crossing angle to form an interaction region with a refractive index n and having four sides forming boundaries with said first and second optical waveguides; and

means for providing strips of substantially transparent optical having a refractive index N_2 that is less than n at said four sides forming said boundaries of said interaction region with said first and second optical waveguides, whereby optical signals initially propagating in said first and second optical channels propagate through said interaction region and continue to propagate in said initial propagating channels therebeyond while being substantially reflected in the interaction region from the optical channels in which the optical signals are not initially propagating.

4,130,343

COUPLING ARRANGEMENTS BETWEEN A LIGHT-EMITTING DIODE AND AN OPTICAL FIBER WAVEGUIDE AND BETWEEN AN OPTICAL FIBER WAVEGUIDE AND A SEMICONDUCTOR OPTICAL DETECTOR

Stewart E. Miller, Locust, and Kinichiro Ogawa, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

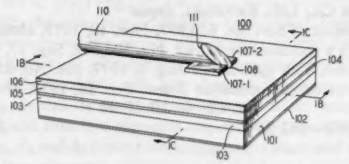
Filed Feb. 22, 1977, Ser. No. 770,796

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.15 **31 Claims**

1. In combination, a semiconductor optical source having a light-emitting surface, an optical fiber waveguide having a central axis, a terminating portion of said fiber waveguide being affixed to said surface such that the axis of said terminating portion is substantially parallel to said surface so that a portion of the light power radiated from said surface is directly

refracted into said optical fiber waveguide, and means at the end of said terminating portion for reflecting another portion



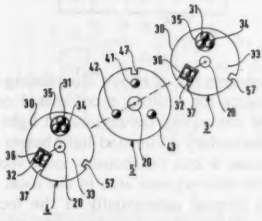
of the light power radiated from said surface into said optical fiber waveguide.

4,130,344

CONNECTOR FOR OPTICAL FIBRES

Jean-Louis Lemonde, Le Chesnay, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Aug. 19, 1977, Ser. No. 826,099
Claims priority, application France, Aug. 24, 1976, 76 25578
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.21 **17 Claims**



1. A connector for end to end connecting of optical fibres, said connector comprising; two interconnectable cylindrical sleeves, each sleeve having an axial channel for receiving the end of an optical fibre to be connected, and assembly means for assembling the sleeves with their respective channels in alignment, the assembly means including at least one point-line-plane positioning means disposed between the facing front surfaces of said sleeves to define a reproducible positioning of one sleeve in relation to the other, the sleeves including transverse positioning means acting on the ends of the fibres in their respective channels, for alignment of the ends of the fibres, and said transverse positioning means comprising a set of radially oriented rods of adjustable radial position.

4,130,345

OPTICAL COUPLING APPARATUS

O. Leonard Doellner, Tucson, Ariz., assignor to The Boeing Company, Seattle, Wash.

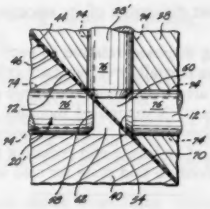
Filed Feb. 25, 1977, Ser. No. 772,064
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.22 **9 Claims**

1. A fiber optic Tee coupler comprising:

first, second and third optical transmission cables each including a plurality of individual optical fibers;

a first support body having at least one planar face, said first and third optical transmission cable being fixedly embedded in said first support body with each individual optical fiber of each of said first and third optical transmission cables being substantially coplanar with and axially parallel to each other optical fiber within that same optical transmission cable, each said individual optical fiber of said first optical transmission cable being substantially coplanar and substantially orthogonal to an associated optical fiber of said third optical transmission cable with a first portion of the terminating end face of each optical fiber of said first and third optical transmission cables being substantially coincident with said planar face of said first support body and a second portion of the terminating end face of each of said optical fibers of said first optical transmission cable being in substantial contact with a portion of the terminating end face of said associated coplanar optical fiber of said third optical transmission cable;

a second support body having at least one planar face, said second optical transmission cable being fixedly embedded in said second support body with said individual optical fibers of said second optical transmission cable being substantially coplanar and substantially axially parallel with one another, at least a portion of the terminating end face of each of said individual optical fibers of said second optical transmission cable being substantially coincident with said planar face of said second support body, said first and second support bodies being configured and arranged for affixing said first support body to said second support body with said planar surfaces of said first and



second support bodies in juxtaposition with one another to position each of said individual optical fibers within said second optical transmission cable in substantial optical and axial alignment with an associated individual optical fiber of said first optical transmission cable; and

a semi-reflective interlayer disposed between said planar surfaces of said first and second support bodies, said interlayer being positioned and arranged for substantial contact with said portions of said end faces of each individual optical fiber of said first, second and third optical transmission cables that are substantially coincident with said planar surfaces of said first and second support bodies, said semi-reflective interlayer reflecting a first portion of the optical energy travelling through each individual one of said optical fibers of said first optical transmission cable and impinging on said interlayer into said individual associated optical fiber of said third optical transmission line, said semi-reflective interlayer transmitting a second portion of said energy travelling through each individual one of said optical fibers of said first optical transmission cable and impinging on said interlayer into said individual associated optical fiber of said second optical transmission cable.

4,130,346

SUPER IMPOSED FRESNEL LENSES FOR CHANNEL INDICATORS

Eugene J. Polley, Lombard, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

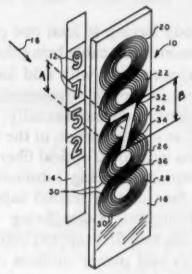
Filed Oct. 3, 1977, Ser. No. 839,042
Int. Cl.² G02B 27/02
U.S. Cl. 350—114 **10 Claims**

1. For use in a television receiver having an array of closely spaced channel indicators disposed in a substantially common plane and having means for illuminating the channel indicator which identifies a received television signal, a lens system for

magnifying the image of the illuminated channel indicator, comprising:

a transparent plate disposed adjacent to and in a plane substantially parallel to the plane of the channel indicators; and

a plurality of substantially coplanar circular fresnel lenses disposed on said plate, each such lens being located in optical alignment with, and having a diameter greater



than the largest dimension of, its associated channel indicator,

said lenses being disposed relative to each other such that adjacent lenses partially overlap each other, whereby the effective lens area over which the image of an illuminated channel indicator is magnified includes the overlapping areas of adjacent lenses, thus increasing the extent of magnification of an image and reducing the total amount of space required on said plate for said lenses.

4,130,347

FINE-LINE DIFFRACTIVE SUBTRACTIVE COLOR FILTERS

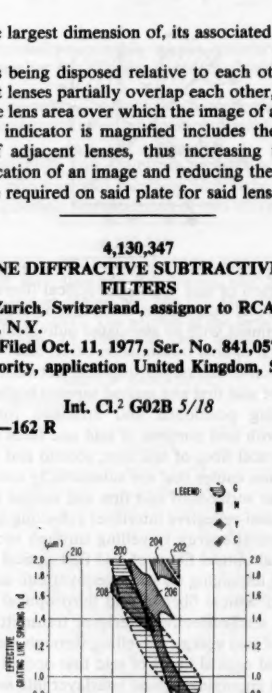
Karl Knop, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,057

Claims priority, application United Kingdom, Sep. 16, 1977, 44394/77

Int. Cl.[2] G02B *5/18*

U.S. Cl. 350—162 R **40 Claims**



1. In a fine-line rectangular-profile diffractive subtractive filter surrounded by a medium having an index of refraction n_1 and responsive to the illumination thereof with unpolarized white light for deriving zero diffraction order output light exhibiting a single one of the group of colors consisting of cyan, magenta, yellow and green, wherein said filter has a given line spacing d and said rectangular-profile has a given aspect ratio b and a given optical depth a; the improvement:

wherein the respective values of n_1d and b define a point within a certain one of plot areas **200**, **202**, **204**, **206** and **208** of FIG. **2**.

4,130,348

OPTICAL SYSTEM FOR A COHERENT LIGHT ILLUMINATING SOURCE

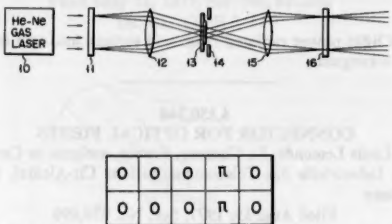
Masana Minami, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 630,497, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 506,853, Sep. 17, 1974, abandoned. This application Aug. 2, 1977, Ser. No. 821,192

Claims priority, application Japan, Sep. 18, 1973, 48-104559

Int. Cl.[2] G02B *27/28*

U.S. Cl. 350—162 SF **6 Claims**



0	0	0	π	0
0	0	0	π	0
0	0	0	π	0
π	π	π	0	π
0	0	0	π	0

1. An optical system for an object illuminating light source, comprising a source for emitting a collimated coherent light beam, means for converting the collimated light beam into a multiplicity of secondary collimated light beams travelling in different directions, a lens for focusing each secondary light beam at a unique convergence area in the focal plane of the lens and means located substantially at the focal plane for giving either one of "0"-relative phase or "π"-relative phase to each secondary light beam convergence area to cancel at a plane spaced from the phase giving means all interference fringes, created by the interference of the secondary light beams, except for those interference fringes caused by the secondary light beams incident on the lens having the greatest angle relative to the optical axis of the lens.

4,130,349

RETROFOCUS TYPE WIDE ANGLE LENS SYSTEM

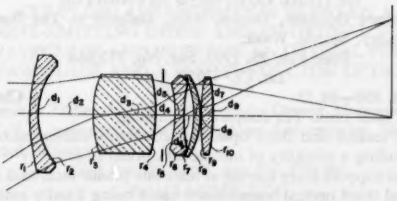
Kazushi Hyakumura, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1977, Ser. No. 784,796

Claims priority, application Japan, Apr. 6, 1976, 51-37849

Int. Cl.[2] G02B *9/60*

U.S. Cl. 350—216 **4 Claims**



1. A retrofocus type wide-angle lens system comprising a first negative meniscus lens element, a second positive lens element, a third negative lens element, a fourth positive meniscus lens element and a fifth positive lens element, and said lens system satisfying the following conditions:

(1) $|r_3| < |r_1|$

(2) $0.12f < d_4 < 0.13f$
(3) $1.6d_4 < d_5 + d_6 + d_7 + d_8 + d_9 < 1.8d_4$
(4) $2.8d_4 < d_3 < 2.9d_4$
(6) $0.8 < |r_9|/|r_{10}| < 1.4$

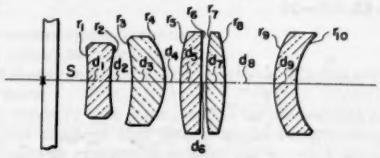
wherein, the reference symbols r_1, r_3, r_9 and r_{10} represent radii of curvature on the object side surface of said first lens element, the object side surface of said second lens element and both surfaces of said fifth lens element, the reference symbols d_3, d_5, d_7 and d_9 designate thicknesses of the second, third, fourth and fifth lens elements respectively, the reference symbols d_4, d_6 and d_8 denote the airspaces between said second and third lens elements, between said third and fourth lens elements, and between said fourth and fifth lens elements respectively.

4,130,350

MEDIUM MAGNIFICATION OBJECTIVE FOR VIDEO DISKS

Toshimichi Koizumi, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 27, 1977, Ser. No. 801,249
Claims priority, application Japan, May 31, 1976, 51-63250; Jun. 4, 1976, 51-65303
Int. Cl.² G02B 9/34, 9/60
U.S. Cl. 350—216 **7 Claims**



1. A medium magnification objective for video disks comprising a first, second, third and fourth lens components, said first lens component being a negative lens, said second lens component being a positive meniscus lens with its concave surface positioned toward the object side, said third lens component having positive refractive power, said fourth lens component being a negative meniscus lens with its convex surface positioned toward the object side, said medium magnification objective for video disks satisfying the following conditions:

$$1.0 \leqq d_3/d_2 + d_4) \leqq 1.5 \quad (1)$$

$$2.2 \leqq r_3/f \leqq 3.4 \quad (2)$$

$$0.6 \leqq \left|r_3\right|/r_2 \leqq 0.9 \quad (3)$$

$$0.51 \leqq r_{10}/f \leqq 0.63 \quad (4)$$

$$2.7 \leqq \left|f_4\right|/\left|f_1\right| \leqq 3.7 \quad (5)$$

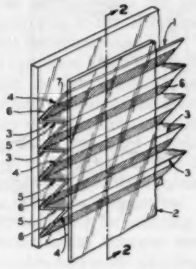
wherein reference symbol r_2 represents the radius of curvature of the surface on the image side of the first lens component, reference symbol r_3 represents the radius of curvature of the surface on the object side of the second lens component, reference symbol r_{10} represents the radius of curvature of the surface on the image side of the fourth lens component, reference symbol d_2 represents the airspace between the first and second lens components, reference symbol d_4 represents the airspace between the second and third lens components, reference symbol d_8 represents the airspace between the third and fourth lens components, reference symbol f_1 represents the focal length of the first lens components, reference symbol f_4 represents the focal length of the fourth lens component and reference symbol f represents the focal length of the lens system as a whole.

4,130,351

RADIO-CHROMIC COMBINED ABSORBING REFLECTING AND TRANSMITTING PANEL

Sergius N. F. Luboshez, 3530 Pinetree Terrace, Falls Church, Va. 22041

Filed Aug. 4, 1977, Ser. No. 821,703
Int. Cl.² G02B 27/00
U.S. Cl. 350—263 **9 Claims**



1. A radiant energy shade comprising
a front panel;
a rear panel;
said panels being generally coextensive in length and width and facing toward each other;
said front panel having a plurality of predetermined show areas arranged in a regular, repetitive, contoured pattern and a plurality of transparent shade areas between show areas;
said show and shade areas being related to each other so that, when the front of the panel is exposed toward a source of radiation in certain predetermined angular relation to the source, the show areas are positioned to receive direct rays emitted from said source and to lie in ray intercepting relation between said source and the shade areas; and so that in other angular relations to the source, the show areas are in unintercepting relation to the shade areas so that the shade areas are exposed to, and receive, direct rays from the source;
said show areas being opaque and reflective so as to intercept, and reflect forwardly, direct rays impinging thereon from the source in said predetermined angular relations, and to prevent direct rays from striking its shade areas; and
said rear panel being of radio-chromic material, so as to darken where struck by said direct rays, and being spaced rearwardly from said shade areas throughout most of the extent of the shade areas and so as to be impinged upon, and caused to darken, by direct rays from said source through the shade areas in said other angular relations.

4,130,352

PORTABLE MICROFICHE READER WITH FOLDUP LENS AND MIRROR ASSEMBLY

John W. Overman, Colgate, and George V. Johnson, Oconomowoc, both of Wis., assignors to Bell & Howell Company, Chicago, Ill.

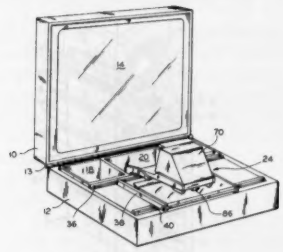
Filed Nov. 11, 1976, Ser. No. 741,007
Int. Cl.² G03B 21/24
U.S. Cl. 353—79 **8 Claims**

1. A projector comprising:
a bottom case portion and a top case portion,
hinge means connecting said bottom and top case portions,
a screen mounted within said top case portion,
a transverse wall interior of said bottom case portion forming a light emitting area and a storage area,
light source means in said light emitting area,
means for completely enclosing said light emitting area

except for an opening for emitting said light in an upward direction,

housing means pivotally mounted to said transverse wall to allow said housing means to swing between a stored position in said storage area and an operating position over said light emitting area,

lens means mounted on said housing means to rest over said opening when said housing is in said operating position,



and means in said housing for reflecting light entering said lens means from said opening,

said reflecting means directing said reflected light onto said screen when said top case portion is swung on said hinge means to an upstanding position which is approximately vertical when said bottom case portion is horizontal.

4,130,353

PROJECTOR WITH CONTROLS FOR THE SLIDE CHANGER

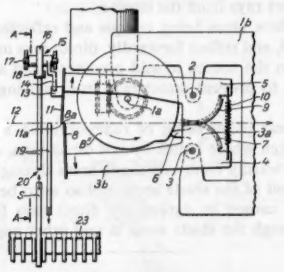
Kurt Henkelmann; Rolf Speier, both of Wissmar, and Wilhelm Schafer, Wetzlar, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,204

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1976, 2657697

Int. Cl.² G03B *21/20, 23/04*

U.S. Cl. 353—85 **8 Claims**



1. In a slide changing apparatus for magazine slide projectors having slide pushrods driven by control means, one of said pushrods serving to insert the slides into an image aperture and the other to move back those slides that have been projected into the magazine, a transport path and a projecting stage located in a common plane and the insertion pushrod serving to insert slides along said path, a slide return path located alternatively on either side of said common plane, driving means transporter means actuated said driving means to transport a slide that has been projected from said projecting stage to said return path, and also to transport said magazine in the same direction, said other pushrod acting to move a slide that has been transported to said return path along said return path back to said magazine, said transporter means being operable alternatively to move a slide to either side of said common plane to give either a forward or reverse operation, said control means being operative so that the pushrods and the driving means operate to move a slide from the magazine to the projection stage, then to the return path, and then back to the magazine, the improvement comprising:

stop means **(8,11)** actuated by said control means, said control means comprising motor driven cams (B″, R″, S″, T″) with surfaces thereon for initiating closing of said stop means simultaneously with removal of a first slide from said projection stage and the movement of a second slide to said projection stage and initiating opening of said stop means after the complete closure of said stop means which coincides with the terminated insertion of said second slide, and interlocking means **(14-18)** provided in said projection stage **(20)** maintaining said stop means closed in change processes lacking slide insertion and means for overriding when said second slide is introduced or when said first slide is reinserted, said means for overriding acting through said slides themselves.

4,130,354

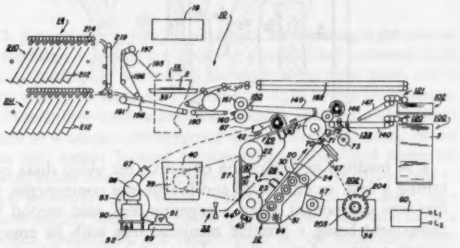
REPRODUCTION MACHINE HAVING DUPLEX JOB RECOVERY CAPABILITIES

Edward L. Steiner, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,016

Int. Cl.² G03B *27/52;* G03G *15/00*

U.S. Cl. 355—26 **8 Claims**



8. In a reproduction machine for making duplex copies from side 1 and side 2 originals, the improvement comprising means for automatically adjusting the reproduction process in the event of a fault condition so that the selected number of copies are produced, said means including:

a first counter means for maintaining a running count of the number of exposures made of each original;

a second counter means for maintaining a running count of the number of successfully delivered copies of each original;

a first flag means for signalling that copies of the side 1 original are being made;

a second flag means for signalling that copies of the side 2 original are being made;

detector means for checking the condition of the first and second flag means in the event of a fault;

means for storing the contents of the second counter when the second flag signal is present at the time of the fault;

means for twice resetting the first and second counters with the stored contents of the second counter as the next two originals are presented to the machine;

means for successively representing the previous side 1 and side 2 originals to the machine; and

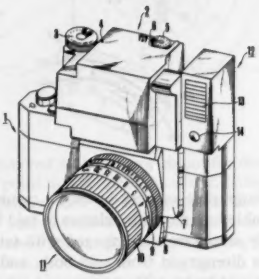
means for successively making a sufficient number of copies from said side 1 and side 2 originals to bring the count of said first and second counters equal to the number of copies selected thereby remaking the copies lost due to the fault.

4,130,355

PHOTOGRAPHIC CAMERA WITH AN AUTOMATIC EXPOSURE CONTROL ADAPTER UNIT DETACHABLY MOUNTED THEREON

Shohei Ohtaki; Soichi Nakamoto, both of Machida; Tomonori Iwashita, Chofu; Yoshiaki Watanabe, Fujisawa, and Susumu Kozuki, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 575,003, May 6, 1975, abandoned. This application Nov. 9, 1976, Ser. No. 740,310
Claims priority, application Japan, May 7, 1974, 49-50499
Int. Cl.[2] G03B *7/16*
U.S. Cl. 354—33 **54 Claims**



1. A camera system comprising:

(a) a camera body unit having:

(1) shutter means arranged to provide different exposure times;

(2) exposure time setting means for said shutter means, said exposure time setting means being arranged to select an exposure time value and having a non-selecting position incapable of selecting any exposure time values beyond a selecting range thereof;

(3) diaphragm means arranged to provide different aperture sizes;

(4) aperture value setting means for said diaphragm means, said aperture value setting means being arranged to select an aperture value; and

(5) detecting means for detecting a state of preparation for flash photographing;

(b) a flash unit for the flash photographing, said flash unit having:

(1) flash light emitting means for emitting a flash light to an object to be photographed; and

(2) light responsive means arranged to receive the flash light emitted from said emitting means and then reflected from said object, said responsive means providing an electrical signal when receiving said reflected flash unit; and

(c) a control unit for automatic exposure, said control unit having:

(1) light measuring means for measuring the brightness of said object, said measuring means providing an electrical output representing the object brightness;

(2) exposure time fixing means for fixing the exposure time at a value suitable for the flash photographing;

(3) exposure control circuit means for determining a proper exposure value, said circuit means being arranged to selectively receive the electrical output of said light measuring means, exposure time value information set by said exposure time setting means, exposure time value information fixed by said exposure time fixing means, aperture value information set by said aperture value setting means and the electrical signal provided by said light responsive means and arranged to be selectively operable according to the following three operation modes:

(i) a first operation mode in which said circuit means determines a proper aperture value on the basis of the electrical output of said light measuring means and the exposure time value information set by said exposure time setting means and controls said shutter means according to the exposure time value information set by the exposure time setting means;

(ii) a second operation mode in which said circuit means determines a proper exposure time value on the basis of the electrical output of said light measuring means and the aperture value information set by said aperture value setting means and controls said shutter means according to the determined proper exposure time value information; and

(iii) a third operation mode in which said circuit means determines the light amount to be emitted from said flash unit on the basis of the aperture value information set by said aperture value setting means and the electrical signal provided by said light responsive means and controls said shutter means according to the exposure time value information fixed by said exposure time fixing means; and

(4) mode selecting means for selecting the operation mode of said circuit means between said first and second operation modes, said mode selecting means being operatively associated with said exposure time setting means and setting the operation mode of the circuit means to said first operation mode when the exposure time setting means is at a selecting position within said selecting range while setting the operation mode of the circuit means to said second operation mode when the exposure time setting means is at said non-selecting position;

said detecting means of the camera body unit detecting the state of preparation for the flash photographing of said flash unit and changing the operation mode of said circuit means from said second operation mode to said third operation mode by connecting said exposure time fixing means to the circuit means while disconnecting said light measuring means from the circuit means in the state of said second operation mode when detecting the completion of preparation for the flash photographing of the flash unit;

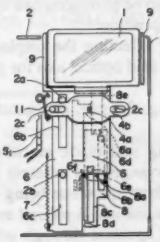
whereby automtic exposures according to exposure time preselection mode, aperture value preselection mode and flash photographing mode are made possible.

4,130,356

CAMERA WITH BUILT-IN FLASH DEVICE

Akira Yamanaka, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 17, 1977, Ser. No. 842,763
Claims priority, application Japan, Oct. 26, 1976, 51-143126[U]
Int. Cl.[2] G03B *15/03*
U.S. Cl. 354—145 **7 Claims**



1. In a camera including a camera body of compact size, a flash device carried by the camera body and including a light emitting portion housed in a casing which is movable between a retracted position substantially contained within said camera body, and an extended operative position in which said light emitting portion projects beyond said camera body and means for releasably retaining said light emitting portion respectively

at said retracted and said extended positions, the improvement comprising:

a first elongated plate member slidable relative to said camera body from a first retracted to a second extended position;

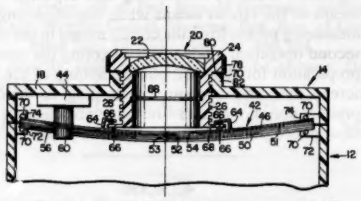
a second elongated plate member carried on said first plate member and slidable relative to said first plate member from a first retracted to a second extended position, said second plate member being coupled at one end thereof to said casing, said first and second plate members being movable substantially in the same direction, and said casing being at its retracted position when both plate members are at their respective first positions, and at its extended position when both plate members are at their respective second positions, whereby said light emitting portion is movable a distance substantially equal to the sum of the distance of movement of said first and second plate members.

4,130,357

FLEXIBLE SHUTTER FOR PHOTOGRAPHIC CAMERA

Irving Erlichman, Wayland, and William T. Plummer, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 18, 1977, Ser. No. 816,486
Int. Cl.[2] G03B *9/28, 9/40*
U.S. Cl. 354—241 **11 Claims**



1. A photographic camera comprising:

a housing;

means within said housing for locating a film unit at an exposure position;

optical means, including at least one optical lens element having an optical axis, on said housing for forming a real image of a scene to be photographed on a film unit located at said exposure position;

actuable means for effecting the displacement of said lens element along its said optical axis for purposes of focusing said camera;

an aperture defining, flexible, elongated blade mechanism; and

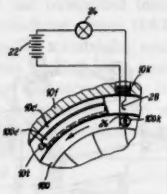
means for mounting said blade mechanism for movement between a first arrangement wherein it blocks image carrying light rays from the scene being photographed from reaching the film unit and a second arrangement wherein it defines its said aperture through which such light rays may pass to effect exposure of the film unit, and for automatically flexing said blade mechanism responsive to the operation of said actuable means to maintain a substantially constant distance between said aperture defined by said blade mechanism and said displaceable lens element during all exposure operations of said camera regardless of variations in camera-to-scene distances between different exposure operations.

4,130,358

PHOTOGRAPHIC CAMERA WITH INTERCHANGEABLE LENS

Rudolf Lang, Grafing Bahnhof, and Gerhard Schwarz, Munich, both of Germany, assignors to Carl Zeiss Stiftung, Heidenhein on the Brenz, Germany

Filed Nov. 8, 1976, Ser. No. 739,642
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1975, 2551571
Int. Cl.[2] G03B *17/00*
U.S. Cl. 354—289 **7 Claims**



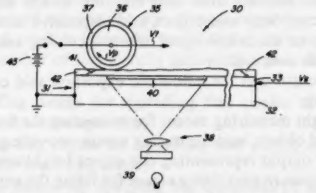
1. A photographic camera having a camera body and an interchangeable lens movable relative to said body from a first position fully seated on and engaged with said body to a second position disengaged from said body and ready to be removed from said body, said camera comprising electric warning signal means, an electric circuit for operating said signal means, a first switch in said circuit, and means responsive to the position of said interchangeable lens for closing said switch to activate said signal means when said interchangeable lens moves away from its said first position.

4,130,359

ELECTROPHORETIC MIGRATION IMAGING APPARATUS AND METHOD UTILIZING ENLARGED MIGRATION ENVIRONMENT

Carl F. Groner, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 708,243, Jul. 23, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,217
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 P **23 Claims**



18. A method of electrophoretic migration imaging comprising:

(a) providing an imaged and non-imaged electrode in spaced relation with an imaging dispersion of electrophotosensitive pigment particles therebetween and an electrical field thereacross for producing a migration of imaging particles; and

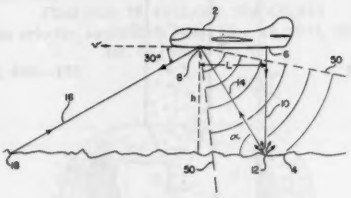
(b) directing a radiation pattern corresponding to an image to be reproduced onto said imaged electrode with a substantially zero relative velocity therebetween, while providing a substantially enlarged migration environment to said imaged electrode.

4,130,360

LASER ALTIMETER/PROFILOMETER APPARATUS

Terence H. Courtenay, Ste-Foy, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jan. 17, 1977, Ser. No. 760,037
Int. Cl.[2] G01C 3/08
U.S. Cl. 356—4 18 Claims



1. Apparatus located on a moving object for determining its distance from a point in a reflecting surface, comprising:

(a) an unmodulated CW laser transmitter for directing a narrow CW laser beam towards said surface,

(b) a laser receiver for receiving resultant signals reflected for said surface,

(c) first means for heterodyning the received signals with at least a part of the transmitter laser beam output signals to determine the optical doppler frequency by which the received signals are doppler shifted with respect to the frequency of the transmitter laser beam output signals, said optical doppler frequency being determined from the angle α between a reference line and an imaginary line joining said surface and said receiver said transmitter and said receiver being a fixed distance apart, and

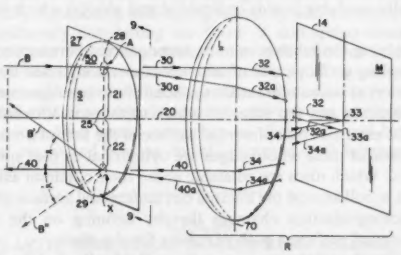
(d) second means for utilizing the determined signals at the optical doppler frequency to calculate the distance of said moving object from said surface.

4,130,361

LENS METER WITHOUT RELATIVELY MOVING OPTICAL PARTS

William E. Humphrey, Orinda, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Jun. 6, 1977, Ser. No. 804,034
Int. Cl.[2] G01B 9/00
U.S. Cl. 356—125 23 Claims



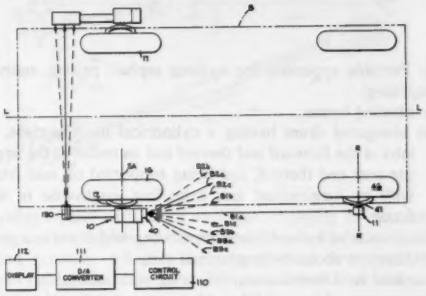
1. A lens meter for measuring a suspect lens comprising: at least one light source having means for emanating a substantially collimated beam of light; a retroreflecting means having optical axis, said retroreflecting means including an entrant aperture aligned to receive light from said light source and displaced from the optical axis of said retroreflector to image a real image of said entrant aperture to an exit aperture at a conjugate location of said retroreflector in a plane including the axis of said retroreflector and said entrant aperture; said retroreflector means further including means for reflecting light exiting said retroreflector at a known angularity with respect to the angularity of light entrant the retroreflector through said entrant aperture; means for placing a suspect lens proximate to said entrant aperture and said imaged exit aperture and means for measuring the changed angular deviation of light exiting said image of said entrant aperture due to the deflection of said suspect lens to determine a first power of said suspect lens.

4,130,362

APPARATUS FOR DETERMINING STEERING POSITIONS OF THE FRONT WHEELS OF A VEHICLE

Melvin H. Lill, San Jose, and James L. Wiederrich, Lodi, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Sep. 19, 1977, Ser. No. 834,637
Int. Cl.[2] G01B 11/26
U.S. Cl. 356—152 10 Claims



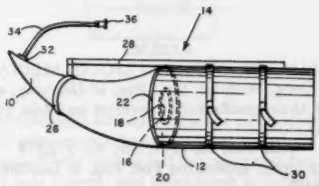
10. In a wheel aligner of the type in which optical projection apparatus is mounted on a steerable wheel of a vehicle for determining alignment conditions of said wheel, the improvement wherein said apparatus comprises projector means for simultaneously projecting a first beam and a second beam, said first beam being projected at a first angle fixed in relation to the plane of said steerable wheel, said second beam being projected at a selected angle in relation to said first beam in a plane generally normal to the plane of said steerable wheel, and beam receiving means optically spaced from said projector means for sequentially receiving said first and second beams as said wheel is steered through a turn angle equal to said selected angle between said first and second beams.

4,130,363

LASER DUMMY LOAD

Danny Graham, Rte. 1, Box 15, Alamogordo, N. Mex. 88310

Filed Jan. 11, 1977, Ser. No. 758,514
Int. Cl.[2] G01J 1/40, 1/42
U.S. Cl. 356—225 10 Claims



1. A laser dummy load comprising:

a generally frusto-concial hollowed member fabricated from laser energy absorptive material;

means for attaching the member to a laser housing;

means for detecting laser energy signals within the member; and

means for connecting the detecting means to an apex portion of the member and for preventing direct reflection of the incident laser light energy back to the laser housing.

4,130,364

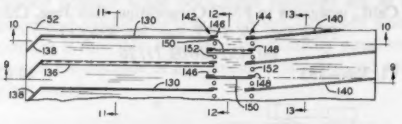
METHOD AND PORTABLE APPARATUS FOR TREATING ASPHALT PAVING MATERIAL

Ralph E. Brown, 7428 Kingsway Dr., Fort Wayne, Ind. 46819

Filed Apr. 28, 1977, Ser. No. 791,717

Int. Cl.[2] B28C *5/20, 5/42;* **B01F** *15/06, 9/06*

U.S. Cl. 366—4 **34 Claims**



1. Portable apparatus for treating asphalt paving material comprising:

a wheeled frame,

an elongated drum having a cylindrical inner surface, an inlet at the forward end thereof and an outlet at the opposite rear end thereof, and being supported on said frame with its longitudinal axis extending lengthwise of said frame,

means carried by said frame for rotating said drum in a given direction about its longitudinal axis,

material feed means communicating with said inlet,

burner means mounted at said drum outlet for directing a stream of hot gases centrally through said drum toward said forward end,

means comprising a plurality of first flights secured to said drum inner surface for raising said asphalt paving material from the lower portion of said drum and then dropping said material in a vertical stream so that it passes through the stream of hot gases while at the same time conveying the material rearwardly at a first rate as said drum rotates, said vertical stream of material being spaced from said drum longitudinal axis by a first horizontal distance, and

means comprising a plurality of second flights secured to said drum inner surface rearwardly of said first flights for raising asphalt paving material from the lower portion of said drum and then dropping said material in a vertical stream while at the same time conveying the material rearwardly at a faster rate than the first rate, said last-mentioned vertical stream of material being spaced from said drum longitudinal axis by a second horizontal distance, said second distance being greater than said first distance so that the material does not pass directly through the stream of hot gases in the rearmost portion of said drum.

4,130,365

MASS TRANSFER IN LIQUID MEDIA

Wolfgang Sittig, Hofheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

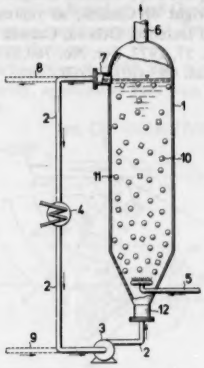
Filed Feb. 28, 1977, Ser. No. 772,574

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1976, 2608480

Int. Cl.[2] B01F *5/10*

U.S. Cl. 366—137 **5 Claims**

1. In a process for transferring mass in liquid media with the aid of inert solid particles having a higher specific gravity than the liquid medium, the improvement which comprises the steps of adding solid particles to the liquid medium in an amount of from 0.1 to 10% by volume and maintaining said solid particles in suspension in the liquid medium throughout substantially the entire volume thereof by imparting to the liquid medium a



substantially continuous movement by circulating the liquid medium in a loop shaped flow path.

4,130,366

HOMOGENIZATION METHOD

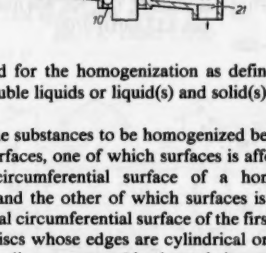
John R. G. Braddyll, Kirby-in-Furness; Joseph H. Aubrey, Barrow-in-Furness; Ernest A. Shaw, Barrow-in-Furness, and Ian Palmer, Barrow-in-Furness, all of England, assignors to Vickers Shipbuilding Group Limited, Cumbria, England

Filed Oct. 17, 1977, Ser. No. 843,029

Claims priority, application United Kingdom, Jul. 8, 1977, 28859/77

Int. Cl.[2] B01F *7/00*

U.S. Cl. 366—288 **11 Claims**



1. A method for the homogenization as defined herein of mutually insoluble liquids or liquid(s) and solid(s) which comprises

supplying the substances to be homogenized between cooperating surfaces, one of which surfaces is afforded by the internal circumferential surface of a homogenization chamber and the other of which surfaces is afforded by the external circumferential surface of the first of a coaxial stack of discs whose edges are cylindrical or part spherical, which discs are rotatable about their common axis so as to roll around the internal circumferential surface of the homogenization chamber thereby defining on the said internal surface a path of rolling for the discs;

causing the substances to pass the path of rolling of the discs so as to cause disintegration of a phase or phases insoluble in the liquid or one said liquid between the discs and said circumferential surface in the region of the point of rolling engagement as the substances pass under gravity down through the homogenization chamber; and

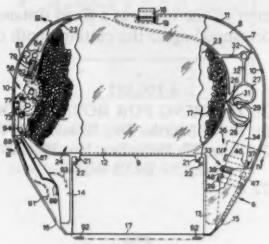
withdrawing the homogeneous liquid obtained from the other end of the chamber beyond the path of rolling of the discs, the discs being unrestrained mechanically against movement towards and away from the internal surface of the chamber throughout their rolling motion and the

pressure between them and the chamber surface being produced solely by centrifugal force.

4,130,367
CARTRIDGE FOR AN ENDLESS INKED RIBBON FOR PRINTING OFFICE MACHINES

Giampaolo Guerrini, Ivrea, and Mario Trompetto, Mercenasco, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Nov. 18, 1975, Ser. No. 632,910
Claims priority, application Italy, Nov. 18, 1974, 70359 A/74
Int. Cl.[2] B41J *33/10*
U.S. Cl. 400—195 **16 Claims**



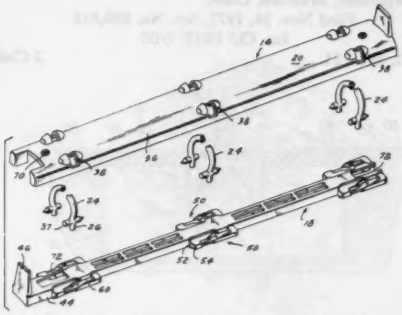
1. An endless inked ribbon cartridge removably mountable in a printing machine of the type comprising a motive shaft for feeding the inked ribbon, said cartridge including a container having a bottom wall and a top wall; an endless inked ribbon disposed in loops and distributed at random in the interior of said container; a first gear assembly having a shaft rotatably mounted in said container between said bottom and said top walls; a connection portion removably engageable with said motive shaft for being driven thereby; a second gear assembly rotatably mounted in front of said first gear assembly and comprising two gears fixed on a common shaft, and two projections projecting outside said two gears; spring means urging said second gear assembly toward said first gear assembly perpendicular to said shaft to nip a portion of said inked ribbon between said first gear assembly and said two gears for feeding the inked ribbon in response to the driving of said motive shaft; slot means adjacent said bottom and said top walls for slidably engaging said two projections and so oriented as to provide movement of said second gear assembly toward and away from said first gear assembly along a plane coplanar to the shaft of said first gear assembly through different inclinations of said two gears with respect to said first gear assembly; and means pivotally connecting said spring means to said common shaft for uniformly distributing the force of said spring means to each of said two gears whatever the inclination of said two gears with respect to said first gear assembly along said plane, wherein said common shaft comprises two surfaces intermediate said two gears which converge toward one another, and said connecting means comprises an element urged by said spring means and bearing on said common shaft intermediate said two gears.

4,130,368
PLASTIC LOOSELEAF BINDER RING ASSEMBLY

Ian H. Jacoby, Franklin Lakes, N.J., and Roland V. Bangha, Middletown, N.Y., assignors to Filtronics Ltd., Middletown, N.Y.

Filed Oct. 28, 1977, Ser. No. 846,447
Int. Cl.[2] B42F *3/04*
U.S. Cl. 402—41 **16 Claims**

1. In a looseleaf binder ring assembly comprising a one-piece backbone formed of a resilient plastic material and having a plurality of pairs of cooperating fingers mounted thereon, the fingers of each pair facing one another and being movable between open and closed positions with respect to each other; a slide bar slidably mounted in said backbone for movement between first and second positions with respect to the backbone, corresponding respectively to the open and closed positions of said fingers, said slide bar having a plurality of pairs of oppositely facing cam surfaces formed thereon associated with each of said pair of fingers; said surfaces being respectively placed in engagement with their associated finger when said base is moved between its first and second positions; one of said surfaces of each pair engaging its associated finger and holding it in its open position when said bar is in its first position and

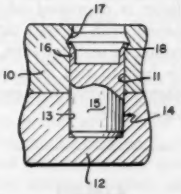


the other of said surfaces of each pair engaging its associated finger and holding it in its closed position when said bar is in its second position; wherein the improvement comprises said fingers being separately formed from said backbone and each having at least one pivot pin integrally formed thereon extending transversely thereof, said backbone having a plurality of downwardly opening pockets formed therein pivotally receiving and engaging said pivot pins, said pockets having an arcuate extend of less than 180° thereby to retain said pivot pins in the pockets while allowing pivotal movement thereof.

4,130,369
DOWEL PIN

Thaddeus A. Wojcik, Greensburg, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 27, 1977, Ser. No. 837,254
Int. Cl.[2] F16B *13/00*
U.S. Cl. 403—297 **3 Claims**



1. In combination, a substrate member and a member to be immobilized with respect thereto, at least one of the members having a through hole therein and the other member having at least a blind hole therein, said holes being in registry, an interior groove near the exterior surface of each member having a through hole therein and in the surface of said through hole, a self-locking dowel pin press fit into the holes to tie the two members together, said dowel pin having a solid shaft portion and a thin wall internally expandable extension section of the same diameter as the solid shaft portion of the pin on each end of the dowel pin facing an open hole, said thin wall extension

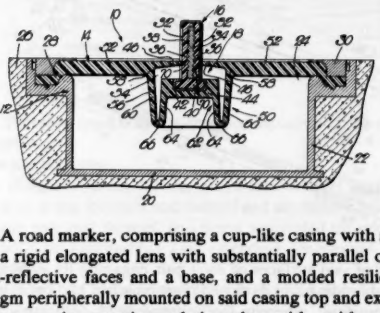
being crimped into the groove to form a rib of uniform thickness the same as the extension and conforming to the shape of the groove, with the free end of said extension being tuck welded in place.

4,130,370

LIGHT-REFLECTIVE ROAD MARKER OF SELF-CLEANING TYPE

Elliott H. Kone, Branford, Conn., assignor to Traffic Standard Incorporated, Branford, Conn.

Filed Nov. 14, 1977, Ser. No. 850,913
Int. Cl.[2] E01F *9/00*
U.S. Cl. 404—11 **3 Claims**



1. A road marker, comprising a cup-like casing with an open top, a rigid elongated lens with substantially parallel opposite light-reflective faces and a base, and a molded resilient diaphragm peripherally mounted on said casing top and extending thereacross in covering relation therewith, with said diaphragm providing a flat web extending inwardly from the mounted diaphragm periphery, a pair of wiper blades, and a lens suspension system, of which said system comprises a recess in said web formed by a first depending endless oval skirt on and continuous with said web and providing spaced opposite side legs, and an inverted channel in said recess having a base and a therefrom depending second endless skirt, with said skirts having lower ends and being thereat continuous with each other and said second skirt being normally infolded on said first skirt, said lens being mounted with its base on said channel base for normal upright lens disposition, and said wiper blades being continuous with said skirt legs and extending substantially coplanar with said web into contact with said lens faces, with said channel base being at a level at which the mounted lens at rest projects above said casing top and said wiper blades contact said lens faces next to said lens base, whereby on passage of an automotive wheel over said mounted lens the latter is depressed with ensuing resilient distortion of said channel with its skirt turned inside-out and into downward extension on said first skirt, and snap-return of said channel with its base to said level on recovery of said channel from its resilient distortion with ensuing wiping of said lens faces by said wiper blades.

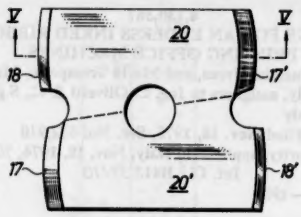
4,130,371

CUTTING INSERT AND ROTARY CUTTER TOOL

Rudolf Druxeis, Landshut, Germany, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Jul. 11, 1977, Ser. No. 814,843
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631666
Int. Cl.[2] B26D *1/00*; B23B *51/00*
U.S. Cl. 407—114 **10 Claims**

1. Cutting insert for chip cutting operations comprising opposed top and bottom surfaces and side surfaces located therebetween, characterized in that at least one of said side surfaces being composed of two surface portions displaced at a fixed distance, the first surface portion (16) intersecting with said top surface to define a cutting edge (18) whereas the second surface portion (17) defines a guide support displaced



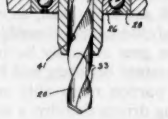
towards the center of the insert at a fixed distance from said cutting edge corresponding to the cutting depth desired.

4,130,372

GUIDE BUSHING FOR ROTARY TOOL

Augustin Vugrin, 16645 Martha Dr., Brookfield, Wis. 53005

Filed Apr. 27, 1977, Ser. No. 791,235
Int. Cl.[2] B23B *49/00*
U.S. Cl. 408—72 R **2 Claims**



1. In a rotary tool assemblage, an axially movable rotary tool having flutes, means for holding a workpiece for engagement by said tool in a predetermined manner, a guide bushing rotatably supported and interposed between the tool and the workpiece, said bushing having a bore to guide and pilot the tool in the direction of the workpiece, said bore in the guide bushing being enlarged at the entry end thereof to provide a shoulder spaced from said end, and set screw means to rotationally interlock the guide bushing and tool while providing for relative axial movement therebetween, said set screw means being secured in the bushing and projecting into the enlarged bore portion for engagement within one of the flutes of the tool in spaced relation from the shoulder, said enlarged bore portion serving to provide relief for any chip material carried by the flutes of the tool into the guide bushing and deflected by the interlocking set screw means.

4,130,373

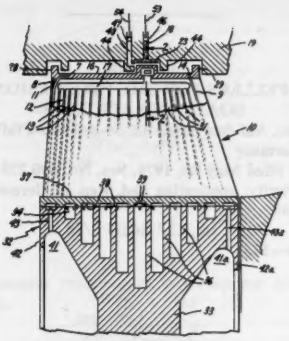
EROSION SUPPRESSION FOR LIQUID-COOLED GAS TURBINES

Walter B. Giles, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,615
Int. Cl.[2] F01D *5/18*
U.S. Cl. 415—1 **8 Claims**

1. A method of reducing erosion of the inner surface of a gas turbine housing due to slamming of droplets of liquid coolant thereagainst, comprising: coating the surface over a defined region of the housing, said defined region extending circumferentially around said housing and having a limited dimension in the direction of the axis of rotation of said turbine with a circumferentially-continuous film of liquid coolant to absorb at least a portion of the kinetic energy of said droplets, and controllably maintaining said film between predetermined thick-

ness limits substantially throughout normal operation of said gas turbine by detecting the film thickness at two spaced locations and drawing off liquid coolant from said region in response to detecting a predetermined difference in the film thickness at said two spaced locations.

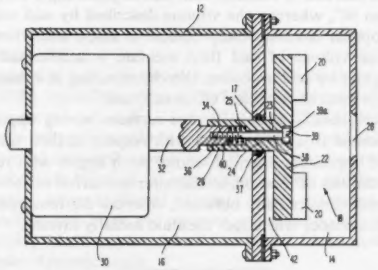


4,130,374

CENTRIFUGAL PUMP ASSEMBLY

Douglas J. Bingler, Furlong, Pa., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Aug. 10, 1977, Ser. No. 823,262
Int. Cl.[2] F01D *7/00*
U.S. Cl. 415—131 **9 Claims**



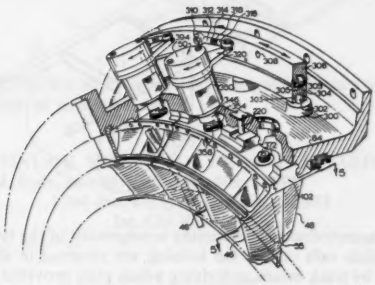
1. A centrifugal pump assembly comprising:
a pump housing defining an impeller chamber therein;
a motor shaft, one end of which projects towards said chamber;
an impeller having a blade portion and a hub portion, said hub portion having a bore therethrough and a recess therein, said blade portion being separated from said housing by a predetermined distance said distance equaling the depth of said recess;
a fastening means projecting through said bore to said end for mounting said impeller to said shaft, said fastening means having a head portion adapted to be received within said recess; and
a spring means biasing said impeller away from said shaft and toward the interior of said chamber.

4,130,375

VANE ROTATOR ASSEMBLY FOR A GAS TURBINE ENGINE

John Korta, Stoney Creek, Canada, assignor to Westinghouse Canada Ltd., Hamilton, Canada

Continuation of Ser. No. 694,928, Jun. 11, 1976, abandoned.
This application Oct. 11, 1977, Ser. No. 840,898
Claims priority, application Canada, Oct. 14, 1975, 237571
Int. Cl.[2] F01D *17/16, 1/04, 9/04;* **F01B** *25/10*
U.S. Cl. 415—161 **2 Claims**



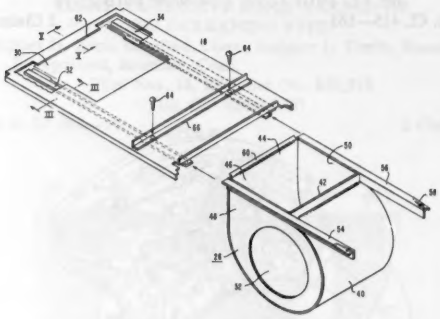
1. A vane rotator assembly for a set of rotatable trailing vane tips in a gas turbine engine, comprising, a turbine casing having a series of substantially evenly spaced apertures located directly radially outwardly from said vane tips, each vane tip being provided with a pair of bearings in said turbine engine to permit rotation of said vane tip, each vane tip further having a projection provided therein to receive coupling means from a vane activator, vane rotation control means comprising a pair of coaxial annular members mounted in concentric relationship on said casing, a first annular member of said pair being mounted on said casing on a series of radial extending dowels mounted on said casing at substantially equidistantly spaced intervals, said first annular member extending around said casing in such a manner as to receive said dowels in an interior slot provided in said first member, said first annular member being restrained from rotation around said casing, said interior slot being of sufficient depth to permit said dowels to move outwardly during operation of said turbine without substantial deformation of said first annular member, said first annular member having a shallow groove on the outward side thereof extending around said first annular member, a second annular member of said pair having roller means mounted therein, said roller means cooperating with said shallow groove in said first annular member to permit said second annular member to rotate about said first annular member, locking means provided to lock said second member at any selected position with respect to said first annular member, said second member having a predetermined number of anchor pivots mounted thereon at evenly spaced intervals around the circumference thereof, a series of upstanding vane activators mounted on said casing in each of said spaced apertures in said casing, each of said upstanding vane activators having a pivot arm extending therefrom with a pivot joint at the end thereof, said anchor pivots and said pivot joints being intercoupled by an arm of adjustable length, said pivot arm being coupled to said projection of said vane tips by an intermediate assembly which is secured to said projection, said intermediate assembly having spring means to bias said vane in an outward direction, said intermediate assembly also being arranged to seal said apertures in said housing.

4,130,376

FAN MOUNTING ARRANGEMENT

Robert J. Dietsche, Elyria, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 23, 1977, Ser. No. 809,351
Int. Cl.[2] F01D *25/24*
U.S. Cl. 415—219 C **5 Claims**



1. In a centrifugal fan mounting arrangement of the type in which slide rails on the fan housing are received in sliding relation by track means underlying a base plate provided with an opening to register with the discharge opening of the fan, the improvement comprising:

flange means at the edge of the discharge opening of the fan housing which leads as the fan housing is slid in a front-to-rear direction along the base plate toward its installed position, said flange means projecting from said housing in said leading direction;

upwardly directed ramp means associated with said track means for lifting the leading edge of said fan before it reaches its final position as it is being slid, so that said flange means will clear and overlie the marginal portion of the base plate bounding the rear edge of the opening in the base plate; and

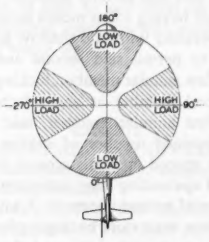
means for fastening said slide rails to said base plate at points on the front side of said discharge opening.

4,130,377

HELICOPTER BLADE AND ROTOR

Robert H. Blackwell, Jr., Derby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 13, 1977, Ser. No. 815,613
Int. Cl.[2] B64C *27/38, 27/46*
U.S. Cl. 416—132 R **10 Claims**



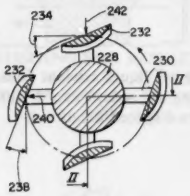
1. A helicopter blade fabricated to be torsionally compliant throughout a portion of the blade span and so that the blade aerodynamic center axis is selectively positioned chordwise forward of the blade center of gravity and elastic axes for a selected portion of the blade span to thereby produce two per rev torsional twisting of the blade due to aerodynamic loading thereof in operation and thereby selectively vary the blade angle of attack.

4,130,378

SIDE PROPELLERS FOR THE PROPULSION OF FAST BOATS AND AIRCRAFT

Horst Eichler, Auf dem Sande 12, 54-Koblenz-Pfaffendorf, Fed. Rep. of Germany

Filed May 26, 1976, Ser. No. 690,275
Claims priority, application Fed. Rep. of Germany, May 26, 1975, 2523180
Int. Cl.[2] B63H *1/16*
U.S. Cl. 416—175 **1 Claim**



1. A propeller for providng forward thrust to a body travelling at relatively high speed through a surrounding fluid medium, comprising:

(a) a propeller hub having an axis of rotation;

(b) a plurality of airfoil surfaces mounted to and distributed radially about said hub; the position of each said airfoil surface being defined by first and second pitch angles, respectively, said first pitch angle being the angle in the rotation direction between the profile longitudinal axis of said airfoil surface and a tangent on the circular arc described by the rotation of said airfoil surface about said propeller shaft, and said second pitch angle being the angle between the profile transversal axis of said airfoil and said axis or rotation, said second pitch angle being less than 90°, whereby the volume described by said rotation propeller is substantially conical in shape and wherein a large volume of said fluid medium is accelerated only slightly by said propeller, thereby resulting in a relatively high level of propeller efficiency; and

(c) peripherally adjacent airfoil surfaces having oppositely oriented first pitch angles with respect to their tangents and oppositely oriented second pitch angles with respect to the axis of rotation, so that alternate airfoil surfaces will direct fluid radially outward, whereas the remaining airfoil surfaces will direct the fluid radially inward.

4,130,379

MULTIPLE SIDE ENTRY ROOT FOR MULTIPLE BLADE GROUP

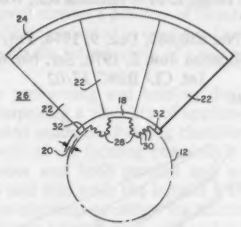
Albert J. Partington, Media, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 7, 1977, Ser. No. 785,379
Int. Cl.[2] F01D *5/30*
U.S. Cl. 416—193 A **4 Claims**

1. An integral turbine blading unit which is disposed about a rotatable rotor, said blading unit comprising:

three radially outwardly extending rotatable blades grouped together in a single axial row along a common platform portion of predetermined arcuate length from which two arcuately separated, axially extending side entry roots

protrude radially inwardly and are engagable with said rotor causing said blading unit to have high rigidity and high frequency resulting in low response to vibratory excitation.



4,130,380

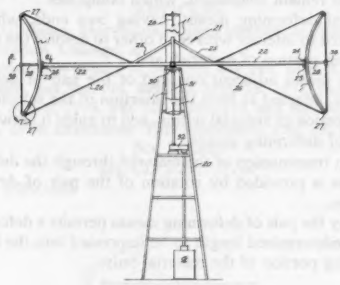
WIND POWERED TURBINE AND AIRFOIL CONSTRUCTION

Heinz W. Kaiser, Rte. 1, Box 248, Eugene, Oreg. 97404

Continuation-in-part of Ser. No. 686,167, May 13, 1976, abandoned. This application Jul. 20, 1977, Ser. No. 817,372

Int. Cl.[2] F03D *3/06*

U.S. Cl. 416—197 A **6 Claims**



2. A wind powered turbine comprising in combination,

a tower, and

a rotor structure supported by said tower including outwardly extending arms, an airfoil blade supported in an upright manner at the outer end of each of said arms, each blade being of curvilinear shape with blade end segments directed outwardly away from the axis of rotor rotation, each blade being of an aerodynamic shape and having a leading edge, tensioned elongate means extending intermediate each blade end segment and its supporting arm to receive blade imparted loads to inhibit blade distortion under dynamic loads.

4,130,381

IMPELLER OF AXIAL-FLOW FAN

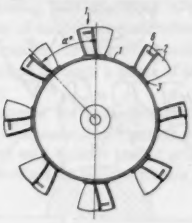
Efim M. Levin, ulitsa Gorkogo, 150, kv. 18; Vladimir P. Sysoev, ulitsa Universitetskaya, 97, kv. 46; Valery A. Rudenko, bulvar Shevchenko, 3, kv. 1, and Oleg K. Pomazan, bulvar Pushkina, 31, kv. 11, all of Donetsk, U.S.S.R.

Filed Jun. 8, 1977, Ser. No. 804,820

Int. Cl.[2] F04D *29/36*

U.S. Cl. 416—196 R **2 Claims**

1. An axial fan impeller comprising a hub, a plurality of rotatable bases fastened to said hub, a rotatable pivot fastening each said base to the hub, two blades mounted on each said base, said blades being constituted as thin sheets each having one edge fixed to said base, a crosspiece connecting said two blades disposed on the common base in the vicinity of the edges of said blades remote from the edges fixed to the base, said blades being disposed at an angular spacing on said base of from 0.15 α to 0.30 α, where α is the angular distance between the pivots of adjacent rotatable bases.



4,130,382

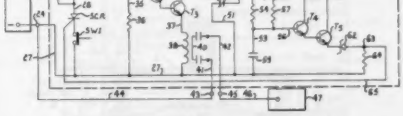
CONTROL SYSTEM FOR IRRIGATION PUMPS

John J. Bode, Box 865, Hastings, Nebr. 68901

Filed Jan. 10, 1977, Ser. No. 758,012

Int. Cl.[2] F04B *49/06*

U.S. Cl. 417—12 **5 Claims**



1. Apparatus for controlling the operation of an irrigation pump having a shut-off system operable to deactivate the pump, said apparatus comprising:

a normally open first circuit adapted to be connected with a power source;

a rain sensitive switch mechanism operable to effect closing of said first circuit when rainfall occurs;

control means associated with said first circuit and operable upon closing of same to activate said shut-off system, thereby deactivating the irrigation pump in response to closing of said first circuit by said switch mechanism;

delay means for opening said first circuit after elapse of a preselected time period following closing of same;

a normally open second circuit adapted to be connected with a power source and arranged in a manner to close after elapse of said time period following closing of said first circuit;

means maintaining said first circuit open when said second circuit is closed; and

a reset switch for opening said second circuit.

4,130,383

APPARATUS FOR NOISE SUPPRESSION IN A GEAR PUMP

Mohammed Moinuddin, Wooster, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

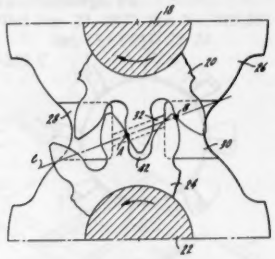
Filed Jun. 23, 1977, Ser. No. 809,229

Int. Cl.[2] F01C *19/08, 21/00, 1/18;* **F04C** *1/04*

U.S. Cl. 418—78 **12 Claims**

1. A fluid pump comprising a housing defining a chamber, an inlet and an outlet communicating with said chamber, a pair of gears supported for rotation in said chamber, said gears having meshing gear teeth defining in one position thereof an area of maximum pressure, means defining inlet and outlet trapping

recesses at one side face of said gears respectively communicating with said inlet and outlet, and a trapped pressure relief



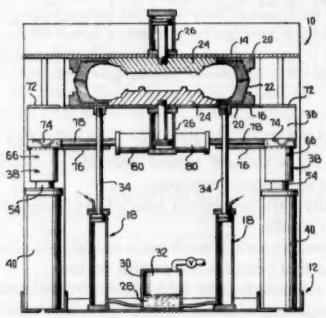
groove having a fixed flow area, said groove communicating said area of maximum pressure with both of said recesses.

4,130,384

TIRE CURING PRESS

Kenneth T. MacMillan, 4992 Wesleyan Woods Dr., Macon, Ga. 31202

Filed Nov. 9, 1977, Ser. No. 849,864
Int. Cl.[2] B29H *5/04, 5/08*
U.S. Cl. 425—25 **14 Claims**



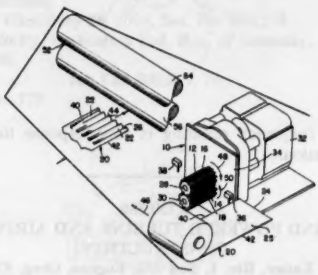
1. A press assembly comprising a pair of cooperating press members, a first of said press members being stationary and a second of said press members being vertically movable, a first long stroke low force fluid motor connected to said second press member for moving the same vertically upwardly a predetermined distance between a first position remote from said first press member a second position contiguous thereto, a second short stroke high force fluid motor disposed between said second movable press member and a fixed support for imparting a locking force against said second press member in a direction urging said second press member toward said first press member, said second fluid motor locking force direction also resisting movement of said second press member from said second position toward said first position under the influence of gravity, means defining an opening in said second press member for passing at least a portion of said second fluid motor entirely through said second press member in said first position, means positionable to close said opening in said second position for transferring said locking force from said second fluid motor to said second press member, and said last-mentioned means being positioned between a terminal end of said second fluid motor portion and said second press member in said second position.

4,130,385

STRIP STRAIGHTENING APPARATUS

Henry F. Hope, 3192 Huntingdon Rd., Huntingdon Valley, Pa., and Stephen F. Hope, 2548 Wyandotte Rd., Willow Grove, Pa. 19090

Division of Ser. No. 530,685, Dec. 9, 1974, Pat. No. 3,966,868.
This application Jun. 2, 1976, Ser. No. 692,196
Int. Cl.[2] B29C *17/02*
U.S. Cl. 425—136 **43 Claims**



1. An apparatus for treating a selected leading portion of a continuous, coiled material having a tendency to curl and adapted to permit the remaining portions of the continuous material to remain unaffected, which comprises

a pair of deforming means, having two ends, which are adapted to interact with each other to deform the selected leading portion of material; and

limiting means adjacent one end of the pair of deforming means, adapted to limit the insertion of the selected leading portion of material within, and to guide it between, the pair of deforming means,

wherein transmission of the material through the deforming means is provided by rotation of the pair of deforming means,

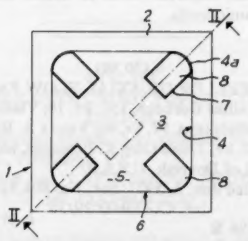
whereby the pair of deforming means permits a deformation of predetermined length to be impressed into the selected leading portion of the material only.

4,130,386

DEVICE FOR PREFORMING AND HOLDING A WRAPPER IN A FORMING MOULD

Jean-Claude H. Hautemont, Gif-sur-Yvette, France, assignor to Societe Anonyme dite: Etude et Realisation de Chaines Automatiques Erca, Orsay, France

Filed Oct. 17, 1977, Ser. No. 842,630
Claims priority, application France, Oct. 26, 1976, 76 32222
Int. Cl.[2] B29C *7/00*
U.S. Cl. 425—383 **22 Claims**



1. In a machine for heat-forming receptacles such as goblets made of thermoplastics material, in which are provided at least one mould whose forming chamber is arranged in a mould body and comprises a cylindrical or truncated side wall, a

bottom wall which is fixed with respect to said side wall and a mould opening opposite said mould bottom, as well as a wrapper-making device adapted to place a wrapper in said forming chamber before a receptacle is heat-formed, the mould being mounted to move between a position of forming and a position of stripping and being adapted to be aligned with said wrapper-making device for the introduction of a wrapper in said forming chamber,

a device for preforming and holding the wrapper in said mould, comprising a plurality of applicator fingers movably mounted inside the forming chamber with respect to the side wall of the forming chamber in radial planes of said chamber and both parallel and transversely with respect to said side wall, the bottom wall of the forming chamber comprising openings for accommodating each finger which is adapted to be concealed in said opening, and further comprising means for controlling said applicator fingers, arranged so as to ensure, on the one hand, the spaced-apart relationship of the applicator fingers with respect to the side wall of the forming chamber when the mould is in position of alignment with said wrapper-making device and, on the other hand, the application of said fingers against the side wall in all the other positions of the mould and during the displacement of said fingers along said side wall until they are concealed in the openings in the bottom wall.

4,130,387

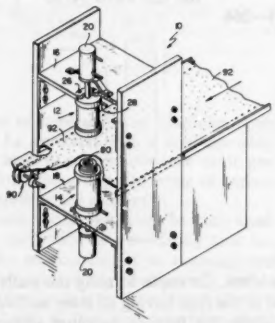
APPARATUS FOR THERMOFORMING PLASTIC ARTICLES

Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 448,191, Mar. 5, 1974, abandoned, and Ser. No. 469,404, May 13, 1974, and Ser. No. 583,427, Jun. 3, 1975, Pat. No. 4,085,177, and Ser. No. 506,333, Sep. 16, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,636

Int. Cl.[2] B29C *17/04*

U.S. Cl. 425—388 **7 Claims**



1. A novel apparatus for thermoforming a hollow plastic article from a sheet of thermoplastic material which comprises:

a thermoforming machine;

lower and upper support members fixedly mounted to said thermoforming machine;

means for linearly moving said sheet of thermoplastic material between said support members;

a male mold assembly mounted on one of said support members; said male mold assembly including an extendible clamping means for engaging a selected portion of said sheet and a male mold means for assisting in the formation of said article;

a female mold assembly mounted to said other support member, said female mold assembly including an extendible clamping means for engaging said selected portion of said sheet with said clamping means of said male mold means and a female member means having a chamber, said male mold assembly and said female mold assembly being fixedly positioned relative to each other at a distance greater than the length of said hollow article to be formed;

means for extending said clamping means to trap said selected portion of said sheet therebetween;

fluid cylinder means for extending and withdrawing said male mold means through a plane of said sheet of thermoplastic means;

fluid cylinder means for extending and withdrawing said female member means to cooperate with said male mold means to form said hollow plastic article; and

means for removing said hollow plastic article.

4,130,388

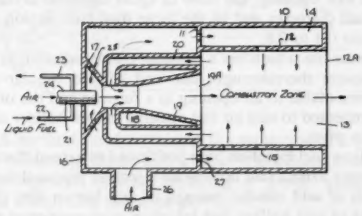
NON-CONTAMINATING FUEL BURNER

Paul Flanagan, Princeton, N.J., assignor to Flynn Burner Corporation, New Rochelle, N.Y.

Continuation of Ser. No. 723,542, Sep. 15, 1976, abandoned. This application Mar. 24, 1977, Ser. No. 780,852

Int. Cl.[2] F23J *15/00*

U.S. Cl. 431—116 **13 Claims**



1. A liquid fuel burner adapted to promote full combustion to produce a non-contaminating blue flame, said burner comprising:

A. an outer casing having a rear section and a forward section, said forward section having a combustion zone therein wherein a hot combustion gas is produced;

B. a Venturi disposed in said rear section and having an inlet section, a constricted throat section and a diffuser outlet section opening into said combustion zone;

C. a feedback path within said rear section intercoupling said combustion zone with said throat section to conduct a portion of said hot combustion gas thereto, said feedback path being constituted by at least one duct disposed in said rear section and extending between said combustion zone and an opening in said throat section;

D. means to inject into the inlet section of said Venturi in the axial direction of the Venturi air-atomized liquid fuel with sufficient momentum to produce an ejector action causing said portion of hot combustion gas to be drawn into the throat section through said feedback path to prevaporize the air-atomized fuel whereby full combustion thereof takes place in the combustion zone;

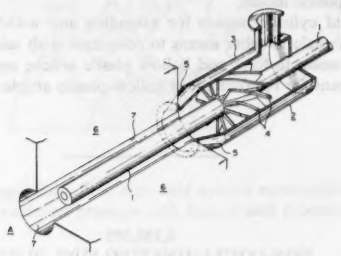
E. a supply of combustion air; and

F. means coupled to the supply to feed substantially all of said combustion air directly into said combustion zone in a direction inclined with respect to said axial direction to react with said air-atomized fuel to generate said hot combustion gas in said combustion zone and to produce a back pressure in said feedback path to enhance the ejector action.

4,130,389
NOX DEPRESSION TYPE BURNERS

Katsuhiko Kaburagi; Yasutaka Yamamoto, both of Wakayama, and Yutaka Suzuki, Amagasaki, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Filed Jan. 25, 1977, Ser. No. 762,238
Int. Cl.[2] F23M 9/00
U.S. Cl. 431—183 7 Claims



1. An NOx depression type burner comprising

a hollow air injection pipe which has an air inlet means and an air exit opening, said hollow air injection pipe comprising two parts, one part being a large diameter straight tubular section and the other part being a tapered section, said tapered section forming at its small diameter end said air exit opening, the ratio of cross sectional areas of said small diameter end to the large diameter section ranging from 0.4 to 0.8;

a burner tile which has a constant diameter, straight tubular passage therethrough, one end of said tubular passage connectable to an opening in a furnace and the other end connected to said air exit opening of said hollow air injection pipe;

a hollow fuel injection pipe positioned to extend through the center axis of said hollow air injection pipe and the center axis of said tubular passage of said burner tile, the open end of said hollow fuel injection pipe positioned a predetermined distance inwardly of said burner tile from the end of said tubular passage connectable to an opening in a furnace,

means positioned in the annular space between said hollow air injection pipe and said fuel injection pipe to cause air passing through said annular space from the air inlet means of said air injection pipe to said air exit opening to swirl;

said predetermined distance being in a range of 0.1 to 4.0 times the diameter of said straight tubular passage.

4,130,390
INSTALLATION AND METHOD OF BURNING CEMENT RAW

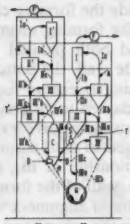
Toshihiro Kobayashi, Tokyo, and Tadaaki Saika, Yokohama, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed May 4, 1977, Ser. No. 793,605
Claims priority, application Japan, May 12, 1976, 51-54561
Int. Cl.[2] F27B 15/00, 7/02
U.S. Cl. 432—14 2 Claims

1. A method of burning cement raw materials comprising the steps of

(a) feeding a part of cement raw materials into a first suspension preheater unit consisting of a plurality of series-connected heat-exchange stages to preheat the raw materials while feeding the remaining part of cement materials into a second suspension preheater unit consisting of a plurality of series-connected heat-exchange stages to preheat the raw materials,

(b) directing all of the raw materials discharged from the second lowermost heat-exchange stage in said second preheater unit into a calciner, which constitutes the lowermost heat exchange stage in said second preheater unit and provided with fuel supply means, thereby calcining the raw materials,



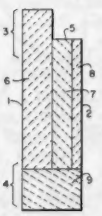
(c) sending a part of the raw materials discharged from the second lowermost heat-exchange stage in said first preheater unit into said calciner while feeding the rest of the materials to the lowermost heat-exchange stage in said first suspension preheater thereby calcining them, and

(d) feeding the equally calcined raw materials from the lowermost heat-exchange stages in both said first and second suspension preheater units into a rotary kiln.

4,130,391
TANK BLOCK

Paul Boggum, and Klaus Schulte, both of Wiesbaden, Germany, assignors to Didier-Werke A.G., Wiesbaden, Germany

Filed Dec. 14, 1976, Ser. No. 750,412
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557242
Int. Cl.[2] F27B 14/06
U.S. Cl. 432—264 9 Claims



1. A tank block, for use in forming the walls of a glass-tank furnace, and of the type having an inner surface which faces a glass melt within the furnace, an outer surface facing away from the glass melt, an upper or head portion, a lower or base portion, an electrode opening extending from said inner surface to said outer surface, said tank block comprising, in sequence from said inner surface to said outer surface:

an inner layer formed of a material which is highly resistant to corrosion by said glass melt, said inner layer being wedge-shaped and having a thickness decreasing from said opening toward both said head and base portions;

a central layer firmly joined to said inner layer and formed of a material which is less resistant to corrosion by said glass melt than said material of said inner layer; and

an outer insulating layer firmly joined to said central layer.

4,130,392

BLEACHING PROCESS

Francis L. Diehl, Wyoming, and James B. Edwards, Roselawn, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 437,569, Jan. 29, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,237
Int. Cl.[2] D06L *3/02, 3/04*
U.S. Cl. 8—101 8 Claims

1. A process for removing stains from fabrics in an automatic clothes dryer during the drying cycle comprising the steps of:

(1) tumbling damp fabrics at a temperature of from 50° C. to 80° C. in the clothes dryer; and

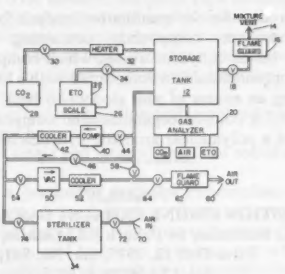
(2) uniformly distributing an effective amount of a solid particulate bleaching composition consisting essentially of a peroxygen bleach having an average particle diameter below about 200 microns onto the damp fabrics within the first 10 minutes to 15 minutes of the drying cycle such that the bleaching composition is able to act in the presence of water on the damp fabrics prior to evaporation of the water from the fabrics.

4,130,393

METHOD FOR STERILIZING WITH AND RECYCLING OF ETHYLENE OXIDE

Lester A. Fox, Augusta, Ga., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jun. 24, 1977, Ser. No. 809,931
Int. Cl.[2] A61L *1/00, 13/00*
U.S. Cl. 422—31 3 Claims



1. A method of sterilization an indefinite number of successive loads to be sterilized with a nonflammable gas mixture containing at least 10 percent ethylene oxide gas and an inert gas selected from the group consisting of carbon dioxide and nitrogen, comprising the steps of:

sterilizing said successive loads in individual sterilization cycles in succession in a sterilizing tank by reusing said mixture by recirculating it to a storage tank after each sterilization cycle while continuously maintaining it as a gas and refortifying it by the addition of substantially pure ethylene oxide so that the proportion of ethylene oxide initially present in the mixture sterilizing each load for each sterilization cycle is at least 10%, said mixture acquiring a small amount of air during each sterilization cycle for which it is used, said refortification with ethylene oxide and said acquisition of air resulting in the mixture used for each successive sterilization cycle being characterized by a proportion of at least 10% ethylene oxide, a decreasing proportion of inert gas and an increasing proportion of air,

periodically venting only a fraction of said mixture when the increasing proportion of air in said mixture produces a mixture which approaches the region of flammability of said mixture and increasing the proportion of inert gas in said mixture to reduce the proportion of air in said mixture while retaining the proportion of ethylene oxide in said mixture at least as great as 10% and

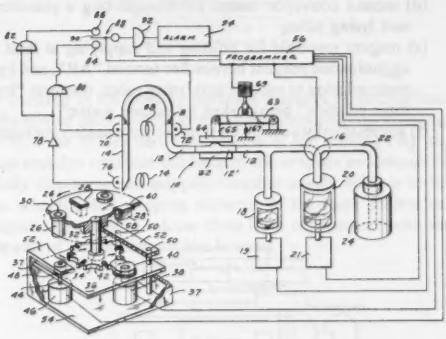
thereafter continuing sterilizing said loads in individual sterilization cycles in succession in said sterilizing tank by reusing said mixture by recirculating it to said storage tank after each sterilization cycle while continuously maintaining it as a gas and refortifying it by the addition of substantially pure ethylene oxide so that the proportion of ethylene oxide initially present in the mixture sterilizing each load for each sterilization cycle is at least 10% until the proportion of air in said mixture again approaches the region of flammability.

4,130,394

SHORT SAMPLE DETECTION

Kent M. Negersmith, Carmel, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Oct. 3, 1977, Ser. No. 839,146
Int. Cl.[2] G01N *1/14*
U.S. Cl. 23—230 R 20 Claims



20. A method for determining the aspiration of a predetermined volume of liquid into a dilutor/dispenser system, said dilutor/dispenser system including a probe system, said method comprising the steps of:

filling said probe system with a diluent to be dispensed along with a predetermined volume of liquid,

introducing a marker at the inlet of said probe system,

aspirating a volume of said liquid to displace said marker along said probe system,

detecting the location of said marker along said probe system to ascertain the volume of said liquid which has been aspirated, and

dispensing said aspirated volume of said liquid along with said marker and a predetermined volume of said diluent in accordance with said marker location.

4,130,395

PROCESS AND APPARATUS FOR DETECTION OF SPECIFIC BIOLOGICAL FACTORS BY MEANS OF OSMOTIC HEMOLYSIS

Chryssanthos P. Chryssanthou, Cliffside Park, N.J., assignor to Beth Israel Medical Center, New York, N.Y.

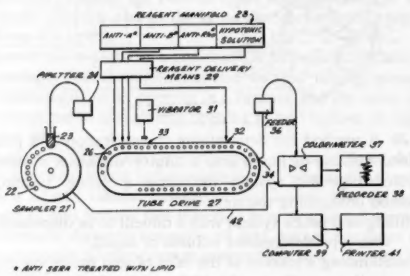
Filed Aug. 19, 1975, Ser. No. 605,955
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 44 Claims

1. A method for blood-typing, for identifying viruses and other red blood cell-agglutinating substances including factors originating in tumors, and for detecting the presence of and identifying antibodies in sera, comprising the steps of (a) treating red blood cells with a test solution suspected of containing therein an agglutinating factor for said red blood cells, or of containing a complex of an agglutinating factor with an antibody thereto, (b) bringing said treated red blood cells into contact with a hypotonic solution under conditions such as to cause strong lysis in untreated red blood cells, and (c) noting by means of color changes the extent of lysis, a degree of lysis

comparable to that of red blood cells treated with a serum known to lack a corresponding agglutinating factor indicating the absence of said suspected agglutinating factor, or the presence of a complex of said agglutinating factor with the antibody thereto, and a substantially reduced degree of lysis indicating the presence of said suspected agglutinating factor uncomplexed with an antibody.

35. Apparatus for automatic blood-typing, cross-matching, identifying viruses, detecting the presence of and identifying antibodies in sera, and detecting agglutinating factors derived from tumors, comprising

(a) containers for holding washed red blood cells, hereinafter referred to as "RBC", suspended in saline solution;
(b) first conveyor means for transporting said containers in preparation for removing samples from said containers;
(c) lysing tubes for holding test reagents and RBC samples taken from said containers;
(d) second conveyor means for transporting a plurality of said lysing tubes;
(e) reagent manifold for holding and supplying at least one agglutination reagent hereinafter termed "AR", and hypotonic solution to each of said lysing tubes, the term "hypotonic solution" being taken to include water;
(f) automatically sequenced sampler for transferring samples



of RBC from each of said containers to a number of lysing tubes equal to the number of AR to be used in typing said RBC;

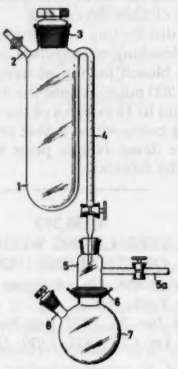
(g) first delivery means for supplying each AR individually to a corresponding number of lysing tubes;
(h) mixing means including shaker or vibrator means positioned for mixing the contents of said lysing tubes essentially immediately and for a controlled period of time subsequent to addition of said AR;
(i) second delivery means for adding hypotonic solution to the contents of said lysing tubes subsequent to addition of AR, said first delivery means, mixing means and second delivery means being spaced apart along said second conveyor means for providing a controlled incubation period;
(j) colorimeter means for determining quantitatively the degree of osmotic lysis of said RBC in said lysing tubes, said colorimeter means being spaced apart from said second delivery means; and
(k) drive means for driving said second conveyor means at a rate such that, in combination with said spacing between said second delivery means and said colorimeter, a suitable fixed time interval is provided for osmotic lysis to proceed to an extent such as to make it possible to determine relative rates of lysis in different samples.

4,130,396

METHOD FOR THE QUANTITATIVE ANALYSIS OF Al-C- AND Al-H- BONDS IN HYDROCARBONS

Ludwig Böhm, Mainz, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,911
Claims priority, application Fed. Rep. of Germany, May 29, 1976, 2624204
Int. Cl.² G01N *21/06, 31/16*
U.S. Cl. 23—230 M **1 Claim**



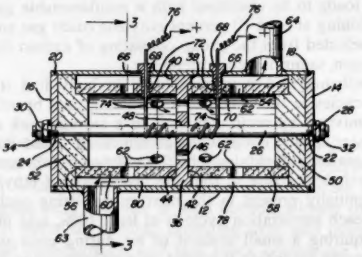
1. A process for the quantitative analysis for the content of organoaluminum compounds containing Al—C— and Al—H— bonds in hydrocarbons, which comprises decomposing said organoaluminum compounds with a lower alcohol and subjecting an excess of said alcohol to back titration with a solution of a colored organometallic compound of an alkali metal and a polynuclear aromatic hydrocarbon.

4,130,397

COMBUSTION ENGINE EXHAUST GAS AFTERBURNER

George L. Robitaille, 64 Pollock Rd., Latham, N.Y. 12110

Filed Oct. 12, 1977, Ser. No. 841,475
Int. Cl.² F01N *3/10, 7/10*
U.S. Cl. 422—168 **11 Claims**



1. An afterburner comprising an elongated tubular body including opposing end walls closing the opposite ends thereof and a central transverse partition dividing the interior of said tubular body inwardly of said end walls into inlet and outlet portions, a pair of tube sections disposed lengthwise within said body between and sealed against opposite sides of said partition and the opposing end walls and the outer radial surfaces of said tube sections spaced inwardly of the opposing inner radial surfaces of said body, whereby annular chambers are disposed about said tube sections inwardly of said body between opposite sides of said partition and the respective opposing end walls, said body including exhaust gas inlet means opening laterally into said inlet portion of said body and

the corresponding chamber and exhaust gas outlet means opening laterally outwardly from said outlet portion of said body and from the corresponding chamber, said tube sections each including exhaust gas passage openings formed therein at points spaced thereabout and longitudinally therealong, said partition including exhaust gas passage openings formed therethrough, said exhaust gas passage openings connecting the interiors of said chambers.

4,130,398

OVAL HEADER HEAT EXCHANGER AND METHOD OF PRODUCING THE SAME

Helmut Knülle, Kassel, and Harald Pieschke, Zierenberg, both of Germany, assignors to Schmidt'sche Heissdampf-GmbH, Kassel-Bettenhausen, Germany

Filed Jan. 7, 1976, Ser. No. 647,170

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1975, 2500827

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.4 **1 Claim**

1. A process for constructing a heat exchanger of the type including banks of double-pipe elements connected at opposite ends thereof to oval headers, the outer pipe of each said element opening into respective said oval headers, the inner pipe of each said element passing through respective said oval headers, said oval headers being joined at opposite ends thereof to main headers by round cross-section transition elements, said process comprising:

forming each of a plurality of integral oval header and transition elements by:

providing a single and integral length of round cross-section pipe;

deforming a portion of said pipe intermediate the ends thereof into an oval shape to form said oval header, while maintaining the round cross-section of said pipe ends to form said transition elements, and while maintaining said round pipe ends in substantial coaxial alignment with each other; and

reducing the diameter and increasing the thickness of the outer end portions of said transition elements to form reduced diameter, increased thickness cylindrical nipple elements;

providing a plurality of coaxial double-pipe elements and attaching by welding opposite ends of said double-pipe elements to said oval headers such that the outer pipe of each double-pipe element opens into the respective said oval headers and the inner pipe of each double-pipe element extends through the respective said oval headers; and

providing a plurality of main headers and attaching by welding said cylindrical nipple elements at each end of said oval header and transition elements to said main headers.

4,130,399

DISMANTLING TOOL

Stig L. Hallerbäck, Gothenburg, Sweden, assignor to Aktiebolaget SKF, Gothenburg, Sweden

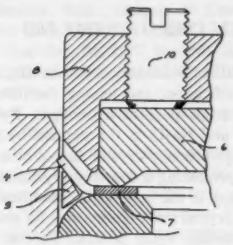
Filed Aug. 29, 1977, Ser. No. 828,897

Claims priority, application Sweden, Oct. 6, 1976, 7611055

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—225 **2 Claims**

1. A tool for dismantling a locking ring consisting of an annular portion having a plurality of radially projecting circumferentially spaced locking tongues for supporting a bearing element such as a ring in an opening in a housing or the like, the annular portion seating against the axial end face of the bearing element and the tongues wedging against the sidewall of the housing at an angle, said tool comprising a generally disc-like member having rib means depending from one axial face thereof adapted to abut the annular portion of said locking ring radially inwardly of the locking tongues, an outer member having a depending flange closely circumscribing the outer sidewall of said disc member of a diameter slightly smaller than



the opening in the housing having a plurality of circumferentially spaced teeth having gripping elements adapted to engage through the spaces between tongues of the locking ring and upon rotation confront the back of the tongues and means for axially displacing the gripping member axially relative to the disc whereby the gripping elements of the teeth deform the tongues upwardly to release them from engagement with the sidewall of the opening in the housing.

4,130,400

COMBUSTIBLE FUEL SLURRY AND METHOD OF PREPARING SAME

Wilfred C. Meyer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 3, 1978, Ser. No. 866,304

Int. Cl.[2] C10L *1/32*

U.S. Cl. 44—51 **10 Claims**

1. An improved mobile and combustible fuel slurry comprising solid particulate carbonaceous material, liquid hydrocarbon fuel, and a particulate cross-linked organic liquid-swellable, organic liquid-insoluble polymer, wherein the polymer is composed of at least 50 mole percent of at least one alkylstyrene wherein the alkyl groups contain from 1 to 20 carbon atoms.

4,130,401

COMBUSTIBLE AND MOBILE FUEL SLURRY AND METHOD OF PREPARING SAME

Wilfred C. Meyer, and Richard R. Klimpel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 3, 1978, Ser. No. 866,305

Int. Cl.[2] C10L *1/32*

U.S. Cl. 44—51 **5 Claims**

1. An improved mobile and combustible fuel slurry comprising solid particulate carbonaceous material, liquid hydrocarbon fuel, a polar liquid flocculating third phase, and a wetting agent soluble in the third phase, wherein the wetting agent has an HLB value in the range of about 6.5 to about 10.

4,130,402

METHOD FOR PRODUCING COARSELY CRYSTALLINE ALUMINA

Bernhard Schepers, Burnside, La.; Heinz Hellinghausen, Ludwigshafen am Rhein, and Alois Kramer, Hassloch, both of Fed. Rep. of Germany, assignors to Guilini Chemie G.m.b.H., Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed May 24, 1977, Ser. No. 800,046

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623482

Int. Cl.[2] C04B *31/02;* C01F *7/02*

U.S. Cl. 51—309 A 9 Claims

1. Coarsely crystalline aluminum oxide having a portion in the beta Al_2O_3 modification, and having the following trace elements: $V_2O_5 > 0.005$ percent by weight, $P_2O_5 > 0.005$ percent by weight, and $Na_2O > 0.8$ percent by weight, and which has an average primary crystal size of more than 6μ.

5. A method for producing a coarsely crystalline aluminum oxide having a portion in the beta Al_2O_3 modification, having an average primary crystal size of more than 6μ and having the following trace elements: $V_2O_5 > 0.005$ percent by weight, $P_2O_5 > 0.005$ percent by weight, $Na_2O > 0.8$ percent by weight, comprising calcining aluminum hydroxide in the presence of vanadium salt and at least one fluoride compound, the amount of vanadium salt being sufficient to provide said weight percentages of V_2O_5, P_2O_5 and Na_2O.

4,130,403

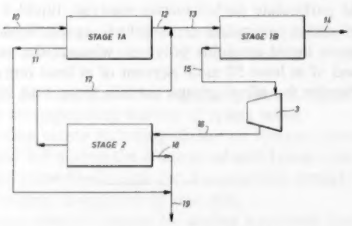
REMOVAL OF H_2S AND/OR CO_2 FROM A LIGHT HYDROCARBON STREAM BY USE OF GAS PERMEABLE MEMBRANE

T. E. Cooley, and A. B. Coady, both of P.O. Box 5244, Station A, Calgary, Alberta, Canada (T2H 1X6)

Filed Aug. 3, 1977, Ser. No. 821,459

Int. Cl.[2] B01D *53/22*

U.S. Cl. 55—16 17 Claims



1. A method for removing H_2S and CO_2 from a gaseous hydrocarbon feed stream comprising H_2S and CO_2 which comprises:

exposing a first side of a thin dry supported cellulose ester membrane having a helium permeability constant of at least 10^{-7} and having a separation factor for CO_2/CH_4 of at least about 5 to said feed stream;

maintaining said first side at a pressure of at least 100 psi greater than the permeate side of said membrane;

separately removing the permeate stream and the residue of the feed stream from contact with said membrane to maintain a higher partial pressure of H_2S and CO_2 on said first side than on said permeate side.

4,130,404

METHOD AND DEVICE FOR CLEANING FLUID FILTERS

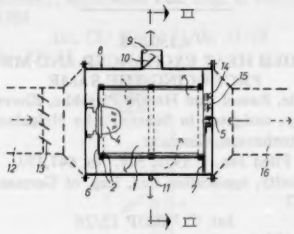
Knut E. Bergdahl, Kvartsgränd 4, S-85252 Sundsvall, Sweden

Filed Oct. 31, 1977, Ser. No. 847,019

Claims priority, application Sweden, Nov. 2, 1976, 7612149

Int. Cl.[2] B01D *23/26*

U.S. Cl. 55—242 3 Claims



1. A device for filtering particulate matter from a fluid comprising:

at least one filter member rotatably supported to rotate during filtration and having a casing defining at least one cavity;

means to direct the fluid to flow through said casing in a generally radially inward direction into the cavity during filtration, said filter member being rigidly connected to at least one vane disposed in the flow path of the fluid; said vane being shaped to effect rotation of said filter member during flow of fluid; and

drive means connected to the filter member and vane to periodically rotate the filter member and vane at a high speed in a direction of rotation opposite to the direction of rotation of the filter member and vane during filtration in order to clean the filter member from particulate matter deposited thereon by centrifugal action and by reversed fluid flow in a generally radially outward direction through the casing of the filter member, said reversed fluid flow being generated by said vane.

4,130,405

AIR CLEANER ARRANGEMENT

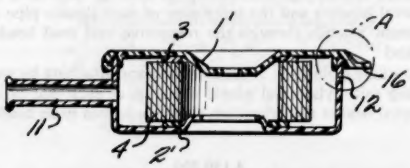
Hajime Akado; Hiroshi Ueda; Akira Yamashita, all of Kariya, and Takemasa Tamura, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 5, 1977, Ser. No. 756,963

Claims priority, application Japan, Jan. 12, 1976, 51-1833[U]; Jan. 12, 1976, 51-1834[U]

Int. Cl.[2] B01D *46/24*

U.S. Cl. 55—503 15 Claims



1. An engine air filter container for use with an air filter element comprising,

a cup-shaped casing member constructed to contain said air filter element, said casing having an open top, a bottom and upstanding from the periphery of said bottom a circumferential side terminating in an upper end first connection portion,

a cover member having an outer edge second connection portion,

said cover member being disposed to cover said open top

and said members being detachably connected by said first and second connection portions,

said connected casing and cover members forming an enclosure having air inlet and outlet means,

one of said first and second connection portions having a vertically disposed first part of given radial width and connected thereto a vertically disposed second part with an enlarged lip of given maximum width radially greater than said given radial width,

said one connection portion including a first horizontally disposed latching shoulder extending from said lip at its maximum width to said first part,

the other of said first and second connection portions for the other of said members being resilient and including means forming a circumferentially extending vertically disposed recess including a first recess part having radially a maximum width recess approximating said given maximum width and vertically extending therefrom a second recess part having a recess width radially less than said given maximum width,

said recess forming means including a second horizontally disposed latching shoulder extending from said first recess part at its maximum width to said second recess part to form a side thereof and being locked with said first shoulder by said lip being in said first recess part to cause said casing and cover members to be detachably connected as aforesaid, and

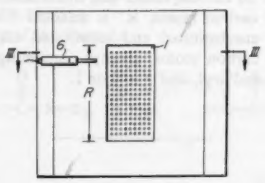
manually operable flange means arcuately extending radially outwardly of the said other connection portion for spreading the width of said recess at said second shoulder to allow said enlarged lip to pass through said second recess part for locking and unlocking of said first and second connecting portions to effect connecting and disconnecting of said cover and casing members,

said recess forming means including at least one aperture in its outside periphery for more readily allowing at least said second recess part to be spread by manual manipulation of said flange means, said at least one aperture being adjacent and about at least as long as said second shoulder.

4,130,406
METHOD OF DETECTING BREAKAGE OF GLASS FIBER FILAMENT

Isao Wakasa; Yutaka Kawaguchi, and Hiroaki Shono, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Aug. 22, 1977, Ser. No. 826,931
Claims priority, application Japan, Sep. 28, 1976, 51-116193
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **10 Claims**



1. A method of detecting breakages of glass fiber filaments being drawn through orifices of an orifice plate, comprising the steps of

arranging a radiation thermometer in such a way that a portion of a glass fiber filament at least immediately below at least one of said orifices is focused on the field of view of said radiation thermometer, and

sensing by means of said radiation thermometer a variation in intensity of radiant light or heat emitted from a bead of molten glass when as a result of a breakage of the filament through said one orifice the molten glass bead grows on the undersurface of said orifice plate at said one orifice and said bead growth is focused on said field of view of said radiation thermometer to cause a variation in output from said radiation thermometer, whereby the breakage of the filament is detected based on said variation in output from said radiation thermometer.

4,130,407
STRENGTHENING OF GLASS

Nobel Ida, Boulder, Colo., assignor to Duraglass Research & Development Corp., Boulder, Colo.

Filed Jun. 16, 1977, Ser. No. 807,256
Int. Cl.² C03C *15/00, 17/00;* C03B *27/00*
U.S. Cl. 65—30 E **11 Claims**

1. A method of strengthening glass against failure under tension, comprising:

(a) mixing a fatty acid with the salt of an alkaline earth metal to form a fatty acid derivative wherein the metal is joined to a carboxyl group of the fatty acid, and

(b) applying the fatty acid derivative to glass having the same alkaline earth metal as a constituent element thereof at a temperature between the melting point of the derivative and and approximately 300° C., the derivative being chemisorbed on the glass surface through chelating between said alkaline earth metal of the derivative and a constituent element of the glass composition.

9. The method of strengthening lime glass, containing a known alkaline earth metal constituent against failure under tension by strengthening the micro crack structure of the glass, comprising:

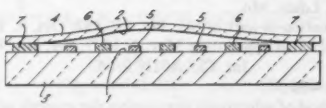
(a) applying to the surface of the glass an alkaline earth metal salt of a straight chain, saturated, mono-carboxylic fatty acid with terminal carboxyl group in a diluent carrier miscible and inert with respect to said salt, at a temperature between the melting point of the salt and 300° C., wherein the alkaline earth metal of the salt is the same as the known alkaline earth metal constituent of the glass; and

(b) cooling the glass slowly to minimize thermal stress.

4,130,408
METHOD OF FORMING LARGE LIQUID CRYSTAL CELLS

William A. Crossland, Harlow, and Joseph H. Morrissy, Dunmow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 821,027
Claims priority, application United Kingdom, Sep. 3, 1976, 36692/76
Int. Cl.² C03B *23/20*
U.S. Cl. 65—43 **18 Claims**



1. A method of making an envelope in which two glass sheets are secured with a glass perimeter seal to form the envelope, comprising the steps of:

depositing a glass on one of the sheets to form an array of spacer dots, said glass having characteristics such that when it is heated to a predetermined temperature below the softening temperature of the sheets, it attains a softening temperature above that of the sheets;

heating said glass spacer dots to said predetermined temperature to effect a change in the softening temperature of the glass spacer dots;

depositing a glass on one of the sheets to form an array of tie dots having a greater thickness than that of the spacer

dots, said glass having characteristics such that it flows at the softening point of the sheets;

depositing a glass on one of the sheets to form a glass perimeter ribbon of greater thickness than that of the spacer dots, said glass having characteristics such that it flows at the softening point of the sheets;

assembling the sheets with the arrays of dots and the perimeter ribbon facing inwardly;

heating the assembly to a temperature at which the tie dots and the perimeter ribbon soften to wet the sheets and at least one of the sheets softens sufficiently for its inner surface to distort to conform to the contour of the inner surface of the other sheet from which it is held uniformly spaced by the unsoftened spacer dots; and

cooling said assembly, whereby the perimeter ribbon seals the assembly and the tie dots connect the sheets.

4,130,409
TRIAZOLYL BUTANDIONES

Margaret C. Shephard, and Paul A. Worthington, both of Maidenhead, England, assignors to Imperial Chemical Industries Limited, London, England

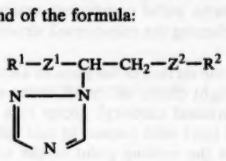
Filed Jun. 1, 1977, Ser. No. 802,545

Claims priority, application United Kingdom, Jun. 8, 1976, 23601/76; Sep. 3, 1976, 36614/76; Feb. 8, 1977, 5140/77

Int. Cl.[2] A01N *9/22, 21/02;* **A61K** *31/41;* **C07D** *249/08*

U.S. Cl. 71—76 **21 Claims**

1. A compound of the formula:



wherein each of R^1 and R^2, which may be the same or different, is unsubstituted for C_1–C_{10} alkyl-substituted cyclopentyl or cyclohexyl unsubstituted or halo-substituted C_1–C_{10} alkyl or unsubstituted or halo-, C_1–C_{10} alkyl-, C_1–C_{10} alkoxy- or nitro-substituted phenyl, and each of Z^1 and Z^2, which may be the same or different, is C = O or an acid addition salt or copper, zinc, manganese or iron complex thereof.

8. A fungicidal or plant growth regulating composition, the composition consisting essentially of a fungicidally or plant growth regulatingly effective amount of, as active ingredient, a compound, salt or metal complex as claimed in claim 1, and a carrier for the active ingredient.

4,130,410
HERBICIDAL USE OF SUBSTITUTED PHENYL PHOSPHINIC ACIDS

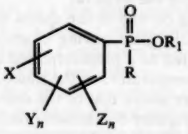
Milton J. Sabacky, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 620,982, Oct. 9, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,625

Int. Cl.[2] A01N *9/36*

U.S. Cl. 71—86 **8 Claims**

1. A method of selectively preventing the growth of undesirable broadleaf plants in the presence of narrowleaf plants which comprises applying to the plant system a herbicidally effective amount of a compound having the formula



wherein R is selected from the group consisting of primary and secondary alkyl and trihalomethyl; R_1 is selected from the group consisting of hydrogen, primary and secondary alkyl, ammonium, alkyl ammonium and phenyl substituted by halo, lower alkoxy, nitro and trifluoromethyl; and X, Y and Z are independently selected from the group consisting of hydroxy, halo, trihalomethyl, amino, primary and secondary alkyl, lower alkoxy and thioalkyl; and each n is independently zero or one.

4,130,411
COMPOSITIONS FOR REGULATING UNDESIRABLE PLANT GROWTH

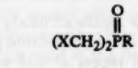
John E. Engelhart, Westfield, and Maynard W. McNeil, Washington, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Nov. 5, 1976, Ser. No. 739,117

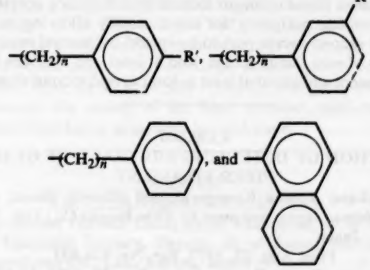
Int. Cl.[2] A01N *9/36, 5/00*

U.S. Cl. 71—86 **10 Claims**

1. A method for killing or retarding the growth of undesirable plants by applying to said plants a composition consisting essentially of at least one inert carrier and a phytotoxically effective amount of an organophosphorus compound



wherein X is bromine or iodine, R is selected from the group consisting of



R′ being in turn selected from the group consisting of CCl_3, CF_3, fluorine, chlorine, bromine, iodine, linear alkyl containing from 1 to 20 carbon atoms and linear alkoxy containing from 1 to 20 carbon atoms, R″ is selected from the group consisting of unsubstituted and substituted alkyl containing from 1 to 20 carbon atoms, alkenyl containing from 2 to 4 carbon atoms and aryl, and n is 0 or 1.

4,130,412
N-ORGANO-N-PHOSPHONOMETHYLGLYCINE-N-OXIDES AND PHYTOTOXICANT COMPOSITIONS CONTAINING SAME

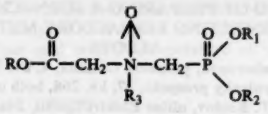
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 613,708, Sep. 9, 1975, Pat. No. 4,062,669, which is a division of Ser. No. 313,706, Dec. 11, 1972, abandoned. This application Sep. 26, 1977, Ser. No. 836,187

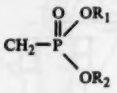
Int. Cl.[2] A01N *9/36*

U.S. Cl. 71—86 **11 Claims**

1. A herbicidal composition comprising an inert adjuvant and an effective amount of a compound of the formula



wherein R_1 and R_2 are each independently selected from the group consisting of hydrogen, salt forming alkali or alkaline earth metal cations, ammonium or organic ammonium groups, said organic ammonium group being derived from an organic amine having a molecular weight below about 300 and containing not more than two amine groups, R is selected from the same group as R_1 plus lower alkyl, and R_3 is selected from the group consisting of $C_nH_{2n}COOR$ wherein n is an integer from 1 to 10 and R is as above defined, and



wherein R_1 and R_2 are as above defined, provided that at least one R must be lower alkyl.

4,130,413

HETEROCYCLIC PHENYL ETHERS AND HERBICIDES CONTAINING SAME

Reinhard Handte, Hofheim am Taunus; Gerhard Hörlein, Frankfurt am Main; Helmut Köcher, and Peter Langeliüddeke, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

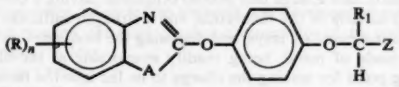
Filed Sep. 8, 1977, Ser. No. 831,480

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640730

Int. Cl.[2] C07D 277/62

U.S. Cl. 71—90 **15 Claims**

1. A compound of the formula



I

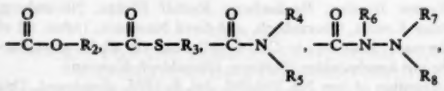
in which

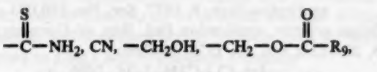
R is halogen, CF_3, NO_2, CN, C_1–C_4alkyl, C_1–C_4 alkoxy or C_1–C_4alkylthio,

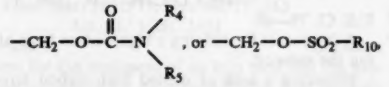
A is O, S, NH, or N—(C_1–C_4)alkyl,

R_1 is H or C_1–C_4alkyl,

Z is a group of the formula







n is zero or 1 or 2,

R_2 is H, C_1–C_{12}alkyl (optionally substituted by 1 to 6 halogen atoms), OH, C_1–C_6alkoxy, C_1–C_4alkylthio, C_1–C_6alkoxy-C_2–C_6alkoxy, halo-C_1–C_2alkoxy, methoxyethoxyethoxy, C_1–C_4alkylamino, di-C_1–C_4alkylamino, phenyl, oxiranyl and/or phenoxy which latter may be substituted once or twice by halogen or C_1–C_4alkyl; C_5–C_6cycloalkyl (optionally substituted by halogen or methyl); C_3–C_6alkenyl, halo-C_3–C_6-alkenyl or C_5–C_6cycloalkenyl, C_3–C_4alkinyl (optionally substituted once or twice by C_1–C_6alkyl, phenyl, halogen or C_1–C_2 alkoxy); phenyl (optionally substituted one to three times by C_1–C_4alkyl, C_1–C_4alkoxy, halogen, NO_2, or CF_3); furfuryl, tetrahydrofurfuryl, or the cation equivalent of an organic or inorganic base;

R_3 is C_1–C_6alkyl, phenyl-(C_1–C_2)-alkyl, the phenyl radical optionally being substituted once or twice by C_1–C_4alkyl and/or halogen, C_3–C_6alkenyl, or phenyl (optionally substituted once or twice by C_1–C_4alkyl and/or halogen)

R_4 and R_5; which are identical or different, are H, C_1–C_6alkyl, hydroxy-(C_1–C_6)-alkyl, C_5–C_6cycloalkyl, or phenyl (optionally substituted one to three times by C_1–C_4alkyl, C_1–C_4alkoxy, halogen, or CF_3), with the proviso that R_4 and R_5 cannot be phenyl at the same time; or wherein R_4 and R_5 together form a methylene chain having 2,4 or 5 CH_2-groups in which one CH_2 group may be replaced by O, NH, or N(CH_3);

R_6 is H or CH_3,

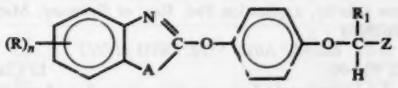
R_7 is H, CH_3, or C_2H_5,

R_8 is H, CH_3, C_3H_5 or phenyl,

R_9 is C_1–C_6alkyl (optionally substituted one to three times by halogen), cyclopropyl, C_3–C_6alkenyl, phenyl, C_1–C_4alkylphenyl C_1–C_4alkoxyphenyl, halophenyl, trifluoromethylphenyl or nitrophenyl and

R_{10} is C_1–C_4alkyl or phenyl (optionally substituted once or twice by halogen, CF_3, NO_2, or C_1–C_4alkyl).

14. An herbicidal composition consisting essentially of an inert carrier and an herbicidally effective amount of a compound of the formula



I

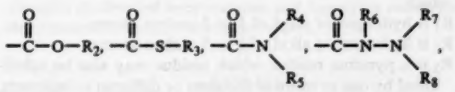
in which

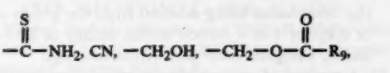
R is halogen, CF_3, NO_2, CN, C_1–C_4alkyl, C_1–C_4alkoxy or C_1–C_4alkylthio,

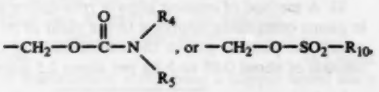
A is O, S, NH, or N-(C_1–C_4)alkyl,

R_1 is H or C_1–C_4alkyl,

Z is a group of the formula







n is zero or 1 or 2,

R_2 is H, C_1–C_{12}alkyl (optionally substituted by 1 to 6 halogen atoms, OH, C_1–C_6alkoxy, C_1–C_4alkylthio, C_1–C_6alkoxy-C_2–C_6alkoxy, halo-C_1–C_2alkoxy, methoxyethoxyethoxy, C_1–C_4alkylamino, di-C_1–C_4alkylamino, phenyl, oxiranyl and/or phenoxy which latter may be substituted once or twice by halogen or C_1–C_4alkyl); C_5–C_6cycloalkyl (optionally substituted by halogen or methyl); C_3–C_6alkenyl, halo-C_3–C_6alkenyl or C_5–C_6cycloalkenyl, C_3–C_4-alkinyl (optionally substituted once or twice by C_1–C_6alkyl, phenyl, halogen or C_1–C_2alkoxy); phenyl (optionally substituted one to three times by C_1–C_4alkyl, C_1–C_4alkoxy, halogen, NO_2, or CF_3); furfuryl, tetrahy-

drofurfuryl, or the cation equivalent of an organic or inorganic base;

R_3 is C_1–C_6alkyl, phenyl-(C_1–C_2)-alkyl, the phenyl radical optionally being substituted once or twice by C_1–C_4alkyl and/or halogen, C_3–C_6alkenyl, or phenyl (optionally substituted once or twice by C_1–C_4alkyl and/or halogen),

R_4 and R_5, which are identical or different, are H, C_1–C_6alkyl, hydroxy-(C_1–C_6)-alkyl, C_5–C_6cycloalkyl, or phenyl (optionally substituted one to three times by C_1–C_4alkyl, C_1–C_4alkoxy, halogen or CF_3), with the proviso that R_4 and R_5 cannot be phenyl at the same time; or wherein R_4 and R_5 together form a methylene chain having 2, 4 or 5 CH_2-groups in which one CH_2 group may be replaced by O, NH, or $N(CH_3)$;

R_6 is H or CH_3,

R_7 is H, CH_3, or C_2H_5,

R_8 is H, CH_3, C_2H_5 or phenyl,

R_9 is C_1–C_6alkyl (optionally substituted one to three times by halogen), cyclopropyl, C_3–C_6alkenyl, phenyl, C_1–C_4alkylphenyl C_1–C_4alkoxyphenyl, halophenyl, trifluoromethylphenyl or nitrophenyl and

R_{10} is C_1–C_4alkyl or phenyl (optionally substituted once or twice by halogen, CF_3, NO_2, or C_1–C_4alkyl).

4,130,414

1,2,3-THIADIAZOLE-5-YL-UREA DERIVATIVES, PROCESS FOR MAKING THE SAME AND PLANT RETARDATION AND DEFOLIATION COMPOSITION CONTAINING SAME

Friedrich Arndt; Hans-Rüdolf Kruger, and Reinhart Rusch, all of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

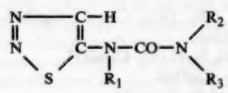
Filed Apr. 28, 1977, Ser. No. 792,016

Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619861

Int. Cl.² A01N *9/22*; C07D *417/12*

U.S. Cl. 71—90 **12 Claims**

1. A 1,2,3-thiadiazole-5-yl-urea derivative of the formula



in which

R_1 is hydrogen or alkyl of 1 to 5 carbon atoms;

R_2 is hydrogen or alkyl of 1 to 5 carbon atoms;

R_3 is a pyridine residue which residue may also be substituted by one or more of the same or different substituents, the substituents being selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, nitro- and trifluoromethyl.

12. A method of causing growth retardation and defoliation in plants comprising applying to the plant or to the ground in which the plant is grown the composition of claim 10 in an amount of about 0.05 to 5 kg per about 2.5 acres of ground.

4,130,415

COPPER FLOTATION WITH ANTI-5-NONYL-2-HYDROXYBENXOPHENONE OXIME

D. R. Nagaraj, 435 W. 119 St., Apt. 7B, and Ponisseril Somasundaran, 560 Riverside Dr., both of New York, N.Y. 10027

Filed Jun. 2, 1977, Ser. No. 802,359

Int. Cl.² B03D *1/02*; C22B *3/00*

U.S. Cl. 75—2 **5 Claims**

1. In a process of froth flotation for the separation of a metal including copper from a material bearing the metal, the improvement which comprises; carrying out the flotation in the presence of anti-5-nonyl-2-hydroxybenzophenone oxime as the collector reagent and recovering at least copper.

4,130,416

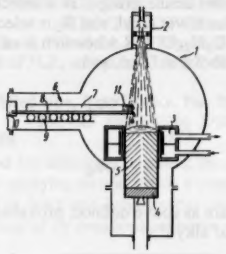
METHOD OF PREPARING A FURNACE CHARGE WHEN SMELTING REFRACTORY METALS AND ALLOYS

Georgy F. Zaboronok, pereulok Obukha, 4, kv. 56; Vladimir E. Efimov, Leninsky prospekt, 37, kv. 268, both of Moscow, and Alexandr T. Kozlov, ulitsa Elektrifikatsii, 24a, kv. 130, Lubertsy, Moskovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 352,632, Apr. 19, 1973, abandoned. This application Oct. 27, 1976, Ser. No. 736,269

Int. Cl.² C22B *4/00*

U.S. Cl. 75—10 R **5 Claims**



1. A method of preparing a furnace charge for drop smelting refractory metals and alloys having a melting point of at least 1900° C. in electron-beam and plasma-arc furnaces with an approximately horizontal feed of a charge therein, comprising the steps of: introducing deoxidant metals into a powdery charge, the metals having a melting point lower than that of the charge and a vapor pressure at least 100 times higher than that of a base metal in the charge at its melting point to permit evaporation in solid state before a fusing zone at a level substantially different from the content in the initial charge and being selected from the group of metals consisting of aluminum, titanium, zirconium and their combinations, in an amount of up to 5 weight percent by mass of the charge; mixing the charge components until a uniform mass is obtained; pressing the mass of said charge into porous briquettes having a density of 50% to 70% of the theoretical and a strength sufficient for being transported on trays; and disposing the briquettes on the trays, made of metal, being readily evaporable at the alloy melting point for making the charge to be fed into the furnace for subsequent drop melting, and substantially completely evaporating deoxidant metals.

4,130,417

PROCESS FOR REFINING HIGH-CARBON FERRO-ALLOYS

Friedrich Breuer, Eschweiler; Günter Duderstadt, Ratingen; Werner Dresler, Bardenberg; Rudolf Fichte, Nüremberg; Peter Kunert, Oberasbach, and Gerd Nassauer, Inden, all of Germany, assignors to GfE Gesellschaft für Elektrometallurgie mit beschränkter Haftung, Düsseldorf, Germany

Continuation of Ser. No. 704,098, Jul. 9, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 850,003

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1975, 2531034; Sep. 10, 1975, 2540290

Int. Cl.² C21C *5/34*, *7/06*

U.S. Cl. 75—60 **15 Claims**

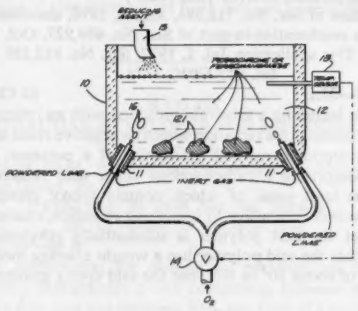
1. A process for refining a high-carbon ferro-alloy, comprising the steps of:

preparing a bath of melted high-carbon ferro-alloy to be refined, said ferro-alloy being selected from the group which consists of ferrochrome and ferromanganese;

preheating said bath to an overall temperature higher than the melting point of said ferro-alloy;

blowing oxygen together with an enveloping protective gas into the preheated bath, in jets trained upon a region spaced from the boundaries of the bath and located below

the surface thereof, at a rate sufficient to cause local superheating of the melt, due to interaction of the oxygen with the ferro-alloy, in said region to a reaction temperature higher than said overall temperature at which carbon



contained in the melt is oxidized by contact with the products of said interaction;

determining changes in said overall temperature; and

controlling the flow of oxygen to prevent a rise of said overall temperature above a predetermined limit.

4,130,418

AUSTENITIC WEAR-RESISTANT STEEL

Tor Hartvig, Raufoss, Norway, assignor to Raufoss Ammunisjonsfabrikker A/S, Raufoss, Norway

Filed Oct. 3, 1977, Ser. No. 839,127

Int. Cl.[2] C22C *38/04, 38/14, 38/28, 38/38*

U.S. Cl. 75—126 B **4 Claims**

1. An austenitic wear-resistant steel having good wear resistance when subjected to abrasive and combined abrasive/impact stresses, the steel consisting essentially of, by weight:

16–23% Mn,

1.1–1.5% C,

0–4% Cr,

0.1–0.5% Ti,

and the remainder being Fe.

4,130,419

PROCESS FOR THE PURIFICATION, MODIFICATION AND HEATING OF A CAST-IRON MELT

Roland Hummer, Leoben-Göss; Wolfgang Thury; Wilfried Westerholt, both of Leoben, all of Austria; Gundolf Höllerling, Ottobrunn, and Reinhard Strigl, Munich, both of Germany, assignors to Linde AG, Wiesbaden, Germany

Filed Mar. 11, 1977, Ser. No. 777,153

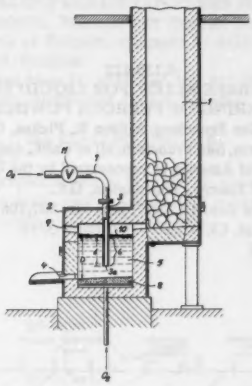
Int. Cl.[2] C21C *5/34*

U.S. Cl. 75—130 R **10 Claims**

1. A process for the treatment of an iron melt, for the production of malleable-iron or globular-graphite iron castings, with oxygen which comprises the steps of:

introducing 0.5 to 2m^3 (STP) of oxygen per minute per ton of melt directly into the iron melt in a forehearth of a cupola furnace through a refractory inlet pipe immersed in said melt; and

controlling the quantity of oxygen per unit time introduced into said melt such that it is substantially the maximum below that at which smoke development above the surface of said melt occurs as determined by visual observation thereof.



4,130,420

NICKEL-CHROMIUM ALLOYS

Miles Firnhaber, Rte. 3, Pewaukee, Wis. 53072

Filed Dec. 5, 1977, Ser. No. 857,125

Int. Cl.[2] C22C *19/00*

U.S. Cl. 75—134 F **2 Claims**

1. An alloy consisting of the following ingredients in percentages by weight:

Ni	41.8 – 46.2
Cr	36.72 – 40.58
W	2.23 – 2.47
Fe	2.71 – 2.99
C	.13 – .17
Si	1.23 – 1.37
Mn	.99 – 1.09
Co	3.48 – 3.84
Mo	5.70 – 6.30

said alloy being characterized by resistance to corrosive attack by molten glass, having superior creep resistance, having strength at elevated temperatures, and imparting resistance to deformation to articles made thereform.

4,130,421

FREE MACHINING Cu-Ni-Sn ALLOYS

John T. Plewes, Berkeley Heights, and Philip R. White, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1977, Ser. No. 866,023

Int. Cl.[2] C22C *9/06*

U.S. Cl. 75—154 **16 Claims**

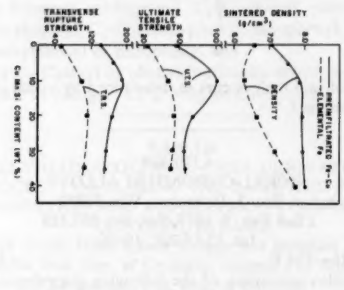
1. Article of manufacture comprising a copper based alloy which is shaped by machining, an aggregate amount of at least 90 weight percent of said alloy consisting of Cu, Ni, Sn, and at least one additive, said aggregate amount having a Ni content in the range of three weight percent to 30 weight percent, said aggregate amount having a Sn content in a range of three weight percent to an upper limit which is a linear function of said Ni content, said upper limit being ten weight percent when said Ni content is three weight percent and said upper limit being 12 weight percent when said Ni content is 30 weight percent, and CHARACTERIZED IN THAT said additive is selected from the group consisting of Se in the range of 0.1–0.5 weight percent of said aggregate amount, Te in the range of 0.1–0.5 weight percent of said aggregate amount, Pb in the range of 0.1–0.2 weight percent of said aggregate

amount, and MnS in the range of 0.2–2.0 weight percent of said aggregate amount.

4,130,422
COPPER-BASE ALLOY FOR LIQUID PHASE SINTERING OF FERROUS POWDERS

John L. Wang, San Francisco; Milton R. Pickus, Oakland, and Meng-Hsiu Chen, San Francisco, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1977, Ser. No. 807,106
Int. Cl.² C22C 1/04; B22F 3/16
U.S. Cl. 75—246 **12 Claims**



1. A powder mixture for the production of a sintered ferrous product comprising an iron-base powder and a copper-base intermetallic compound consisting essentially of about 85–89% copper, about 2–4% manganese, and about 8–11% silicon in an amount sufficient to provide a liquid phase at the material sintering temperature.

8. A sintered ferrous product produced by liquid phase sintering of a powder mixture as defined in claim 1, said sintered product consisting essentially of iron-base particles enriched in manganese and silicon and bonded by a copper-base matrix depleted in manganese and silicon.

4,130,423
PULVERULENT COMPOSITION FOR FORMING PROTECTIVE LAYER ON STEEL MELTS

Marc Chastant, and Paul-Victor Riboud, both of Metz, France, assignors to Institut de Recherches de la Siderurgie Francaise (Irsid), Saint-Germain-en-Laye, France

Filed Mar. 31, 1977, Ser. No. 783,198
Claims priority, application France, Apr. 5, 1976, 76 09879
Int. Cl.² C22B 9/10
U.S. Cl. 75—257 **11 Claims**

1. Composition for forming a protective layer over molten steel in continuous casting processes, the said composition comprising a mixture of a natural silicate, a flux selected from the group consisting of sodium carbonate, fluorspar (CaF_2) cryolite, borates and alkali or earth alkali fluorides and pulverulent carbon,

the natural silicate being a rock of the system Na Al SiO_4 - K Al SiO_4 - SiO_2,

and the said rock having a solidification temperature below 1100° C. and including oxides of sodium and potassium at a ratio as follows

$$\{\%\ Na_2O\} + 0.73\ \{\%\ K_2O\}\ 10\%.$$

4,130,424
PROCESS USING RADIATION CURABLE EPOXY CONTAINING RESIST AND RESULTANT PRODUCT

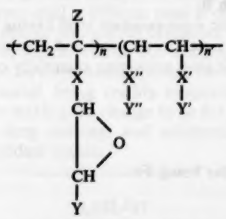
Eugene D. Feit, Berkeley Heights, and Larry F. Thompson, Gillette, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 712,394, Aug. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 408,927, Oct. 23, 1973. This application Jul. 1, 1977, Ser. No. 812,231
Int. Cl.² G03C 1/71
U.S. Cl. 96—35.1 **62 Claims**

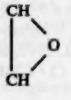
1. Article including a substrate provided with an intimately contacting coating of a radiation-sensitive negative resist material, said material consisting essentially of a polymer, said polymer comprising a carbonaceous chain with substituent branches at least some of which contain epoxy groupings which cross-link responsive to impinging radiation, characterized in that the said polymer is substantially ethylenically saturated; that the said polymer has a weight average molecular weight of about 10^3 to 10^6; that the said epoxy groupings:

are connected to the main polymer chain through at least one branch atom; and that the molecular weight distribution of the said polymer defined as M_w/M_n, in which M_w is the weight average molecular weight and M_n is the number average molecular weight, is numerically equal to a value of less than 5.

22. Article including a substrate to be pattern delineated provided with an intimately contacting coating of negative resist material, said material consisting essentially of a polymer consisting of a primarily carbonaceous chain with side branches containing radiation sensitive groupings which result in cross-linking, said sensitive groupings comprising epoxy groupings, characterized in that the polymer is of a composition represented by the formula:



in which X is any grouping, X′ is any grouping, Z, Y, and Y′ are optional carbonaceous substituents containing from 0 to 4 carbon atoms, and X″ is hydrogen or X″ and Y″ are optional substituents of the class represented by X′ and Y′, respectively, the said polymer being substantially ethylenically saturated, the said polymer having a molecular weight M of from about 10^3 to 10^6 in which said polymer the epoxy grouping



are present in a number of at least one such substituent for every ten carbon atoms in the main polymer chain, in which the molecular weight distribution is defined as M_w/M_n, in which M_w is the weight average molecular weight and M_n is the number average molecular weight, is less than 5, in which the glass transition temperature T_g is below any temperature attained prior to exposure, said polymer being produced by a single step addition polymerization process in which mono-

mers contain the side chains shown in the formula, in which the order of the groupings one designated by the subscript n and one designated by the subscript n' is random and in which the groupings designated by the subscript n and/or groupings designated by the subscript n', while necessarily falling within the chamical classification set forth, are not necessarily identical.

4,130,425

SUBTRACTIVE DEVELOPER FOR LITHOGRAPHIC PLATES

Timothy M. Boyd, Warminster, Pa., assignor to Marcole, Inc., Upper Darby, Pa.

Filed Dec. 29, 1976, Ser. No. 755,449
Int. Cl.[2] G03C 5/24; G03F 7/02
U.S. Cl. 96—48 R 4 Claims

1. A composition for developing presensitized negative, subtractive lithographic plates comprising between 40% and 50% of a first part and between 50% and 60% of a second part, said first part comprising alcohols of lower-alkyls and said second part comprising a mixture of water, ethylene glycol monobutyl ether, nonionic surface active synthetic detergent, soap of the group comprising potassium oleate and linoleate, free fatty carboxylic acid of the group comprising oleic and linoleate acid, and inorganic phosphate.

4,130,426

HEAT DEVELOPABLE LIGHT-SENSITIVE DIAZOTYPE MATERIALS AND PROCESS OF USE

Keiji Takeda, and Masayoshi Tsuboi, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

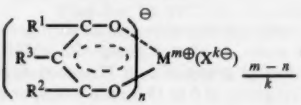
Filed Apr. 22, 1975, Ser. No. 570,316
Claims priority, application Japan, Apr. 22, 1974, 49/45332
Int. Cl.[2] G03C 1/58, 5/34
U.S. Cl. 96—49 10 Claims

1. A heat-developable light-sensitive material comprising a support having thereon at least one layer with

a light-sensitive diazonium salt; and

a metal-β-diketonate chelate compound represented by the following general formula (II):

(II)



wherein R^1, R^2 and R^3 represent an aliphatic group or an aryl group and R^3 can also be a hydrogen atom; M is a metal ion or a complex metal ion capable of forming a chelate compound with a β-diketone and m is an integer corresponding to the positive charge of the metal ion or the complex metal ion; X is an anion; Y is a neutral ligand selected from the group consisting of ammonia and water; k is an integer of 1 to (m-n); n is an integer of 1 to m; m is an integer of from 2 to 4; and l is an integer of 0 to 3 with the proviso that when M is a Co ion, the Co ion is the Co++ ion;

said diazonium salt and said metal-β-diketonate chelate compound being contained in the same layer or different layers, respectively, and being present in sufficient quantity that a positive colored image to an original is produced upon imagewise exposure and heat development.

8. A method of forming an image comprising imagewise exposing the heat-developable light-sensitive material of claim 1 to radiation to which the light-sensitive diazonium salt is sensitive and heating the exposed heat-developable light-sensitive material at a temperature of about 50° C. to about 200° C.

4,130,427

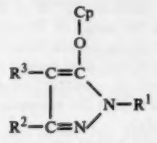
SILVER HALIDE EMULSION CONTAINING TWO-EQUIVALENT COLOR COUPLERS FOR YELLOW

Marcel J. Monbaliu, Mortsel, and Raphaël K. Van Poucke, Berchem, both of Belguim, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed May 31, 1977, Ser. No. 802,053
Claims priority, application United Kingdom, Jun. 9, 1976, 23917/76
Int. Cl.[2] G03C 7/00, 1/40
U.S. Cl. 96—56.5 5 Claims

1. A photographic material comprising at least one silver halide emulsion layer and a 2-equivalent colour coupler for yellow which corresponds to the formula

I



wherein:

Cp represents a pivaloyl acetanilide or benzoylacetanilide yellow forming colour coupler residue which is capable of oxidative coupling with an aromatic primary amino developing agent and which is linked to the 5-pyrazolyl-oxy group at its coupling position,

R^1 represents an alkyl group or an aryl group,

R^2 represents an alkyl group, an aryl group, a carboxyl, an alkoxycarbonyl or an amino group,

R^3 an alkyl group, or

R^2 and R^3 together represent a tri- or tetramethylene group, forming with the carbon atoms to which they are attached a 5- or 6-membered carboxylic ring,

and wherein the 5-pyrazolyloxy group is split off during oxidative coupling with an aromatic primary amine colour developer and forms a competing coupler molecule, which is capable of coupling with the oxidation products of an aromatic primary amino colour developer to form a colourless compound.

4,130,428

COMBINATION OF PHOTOSENSITIVE ELEMENTS SUITED FOR USE IN RADIOGRAPHY

Marcel K. Van Doorselaer, 's-Gravenwezel, Belgium, assignor to AGFA-GEVAERT, N.V., Mortsel, Belgium

Continuation-in-part of Ser. No. 303,384, Nov. 3, 1972, abandoned. This application Oct. 20, 1975, Ser. No. 624,259
Claims priority, application United Kingdom, Nov. 5, 1971, 51628/71; May 31, 1972, 25529/72
Int. Cl.[2] G03C 1/92, 1/76
U.S. Cl. 96—68 25 Claims

1. A combination of photosensitive materials suited for radiography comprising:

(1) two separate fluorescent screens each of which has more than half of its spectral emission above 410 nm and its maximum of emission in the wavelength range of 450–570 nm and an intensification factor of at least 20 at 40 kV and at least 25 at 80 kV,

(2) a photosensitive material comprising a support and at both sides of said support a layer of silver halide, the silver halide being capable of yielding by development a visible, negative silver image, a covering power of more than about 50, and being present in each layer in a corresponding equivalent amount of less than about 4 g of silver per square meter and being spectrally sensitized with (a) sensitizing dye(s) in such a way that it is sensitive for light in the wavelength range of 450–570 nm, and

each of said fluorescent screens being arranged adjacent to one of said emulsion layers.

4,130,429
COMBINATION OF PHOTOSENSITIVE ELEMENTS SUITED FOR USE IN RADIOGRAPHY

Marcel K. Van Doorselaer, 's-Gravenwezel, Belgium, assignor to AGFA-GEVAERT, N.V., Mortsel, Belgium

Continuation-in-part of Ser. No. 303,386, Nov. 3, 1972, abandoned. This application Oct. 20, 1975, Ser. No. 624,258

Int. Cl.² G03C *1/92*

U.S. Cl. 96—82 **30 Claims**

1. A combination of photosensitive materials suited for radiography comprising:

(1) at least one X-ray fluorescent screen material having more than half its spectral emission above about 410 nm and having its emission maximum in the wavelength range of 480 to 600 nm and having a coverage of 250 to 600 g per sq.m of fluorescent substance(s) in a fluorescent layer having a thickness in the range of 70 to 250 microns, the intensification factor of the screen being at least 20 at 40 kV and at least 25 at 80 kV, said screen material containing a dye or a pigment or a mixture of dyes and/or pigments absorbing light within the emission spectrum of the fluorescent substance(s);

(2) a photosensitive silver halide recording material which comprises a support and incorporates at least one silver halide emulsion layer and wherein the combined absorption of the support and of the layers at one side of the support is such that (i) the light absorption spectrum thereof mainly (at least for 50%) corresponds with the light emission spectrum of the fluorescent screen material in the wavelength range of 360 to 600 nm and (ii) the said combined absorption is such that in the range of overlap of said absorption and emission spectrum the optical density resulting therefrom comprises values in the range of 0.6 to 1.3 due to the inherent absorption of the silver halide emulsion layer(s) and the presence of (a) colouring substance(s) in one or more layers of the recording material including the support and the silver halide emulsion layer(s) in which silver halide grains are present that have been spectrally sensitized for visible light situated in the wavelength range of 480 to 600 nm.

4,130,430
SILVER HALIDE LIGHT-SENSITIVE MATERIAL CONTAINING DYE

Masatoshi Sugiyama, and Eiichi Kato, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

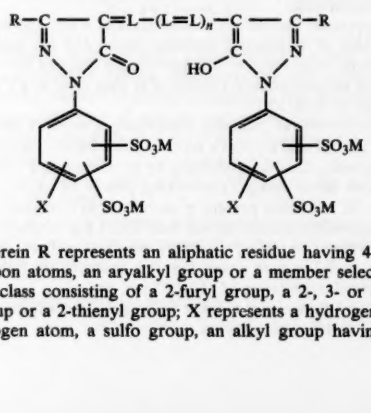
Filed Apr. 19, 1977, Ser. No. 788,948

Claims priority, application Japan, Apr. 20, 1976, 51-44788

Int. Cl.² G03C *1/84*

U.S. Cl. 96—84 A **14 Claims**

1. A siver halide light-sensitive material comprising a support having thereon a silver halide light-sensitive emulsion layer and at least one hydrophilic colloid layer containing a basic polymer and at least one oxonol dye represented by the following general formula (I):



(I)

wherein R represents an aliphatic residue having 4 or more carbon atoms, an aryalkyl group or a member selected from the class consisting of a 2-furyl group, a 2-, 3- or 4-pyridyl group or a 2-thienyl group; X represents a hydrogen atom, a halogen atom, a sulfo group, an alkyl group having 1 to 4 carbon atoms, or a hydroxy group; L represents a methine group; M represents a cation; and n represents 0, 1 or 2.

4,130,431
METAL SURFACE TREATMENT LIQUID AND RUST PREVENTIVE PAINT

Hideo Kogure, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Japan

Filed Jul. 5, 1977, Ser. No. 815,532

Claims priority, application Japan, Jul. 5, 1976, 51-80276; Sep. 8, 1976, 51-107531

Int. Cl.² C09D *5/08*

U.S. Cl. 106—14.33 **6 Claims**

1. In a rust preventive paint comprising a vehicle containing a solvent and at least one member of the group consisting of butyral resin, alkyd resin, phenoxy resin, polybutadiene, phenolic resin, epoxy resin, acrylic resin and hydrolyzed ethyl silicate, and a corrosion inhibiting agent; the improvement comprising, as said agent, 0.0025 to 2.5 ion mol of oxytitanic ion, peroxytitanic ion or mixtures thereof per 1000g of paint, said paint having a pH of less than 6.

4,130,432
TRIORGANOTIN CYANOMETALLATE COMPOUNDS

Hermann W. Wehner, Zwingenberg, and Joachim Lorenz, Bensheim-Auerback, both of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

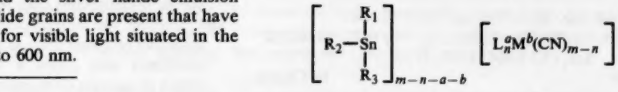
Filed Dec. 16, 1976, Ser. No. 751,229

Claims priority, application Switzerland, Dec. 23, 1975, 16699/75

Int. Cl.² C09D *5/14, 5/16, 5/18*

U.S. Cl. 106—15 R **10 Claims**

1. A compound of the general formula I



(I),

wherein

m is 4, 6 or 8

n is 0 or 1,

a is 0 or 1,

b is 1, 2, 3, 4 or 5,

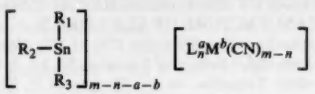
each of

R_1, R_2 and R_3 independently represents an alkyl group of 1 to 18 carbon atoms, an alkenyl group of 2 to 18 carbon atoms, a cycloalkyl group of 5 to 12 carbon atoms, an alkylcycloalkyl group of 6 to 18 carbon atoms, or an aryl group of 6 to 16 carbon atoms which is unsubstituted or substituted by alkyl, alkoxy or alkylthio or oxoalkyl or carbalkoxyalkyl, each of 1 to 12 carbon atoms, or by 1 to 2 halogen atoms or by a nitro group, or an aralkyl group of 7 to 17 carbon atoms which is unsubstituted or substituted by alkyl of 1 to 12 carbon atoms or by 1 to 2 halogen atoms or by a nitro group,

L represents NH_3, pyridine, water, CO, NO or a halogen atom, and

M if m is 4, represents Ni(II), Ni(I), Ni(II), Pd(II), Pt(II), Cu(I), Cu(II), Ag(I), Au(III), Zn(II), Cd(II), Hg(II), and if m is 6 represents Ti(III), V(II), V(III), Cr(I), Cr(II), Cr(III), Mn(I), Mn(II), MN(III), Te(I), Re(I), Re(II), Re(III), Re(IV), Fe(II), Fe(III), Ru(II), Ru(III), Os(II), Co(I), Co(II), Co(III), Rh(III), Ir(III), Pt(IV), and if m is 8, represents Ti(III), Mo(IV), Mo(I), W(IV), W(V), Mn(IV) or Re(V), and with the proviso that R_1, R_2 and R_3 may not all be methyl or all be phenyl at the same time when M is Fe(II) or Fe(III).

2. An antifouling paint composition containing 0.5 to 40% by weight of the composition of a biocidal compound, or mixture of said compounds, of the general formula I



(I),

wherein

m is 4, 6 or 8,

n is 0 or 1,

a is 0 or 1,

b is 1, 2, 3, 4 or 5,

each of

R_1, R_2 and R_3 independently represents an alkyl group of 1 to 18 carbon atoms, an alkenyl group of 2 to 18 carbon atoms, a cycloalkyl group of 5 to 12 carbon atoms, an alkylcycloalkyl group of 6 to 18 carbon atoms, or an aryl group of 6 to 16 carbon atoms which is unsubstituted or substituted by alkyl, alkoxy or alkylthio or oxoalkyl or carbalkoxyalkyl, each of 1 to 12 carbon atoms, or by 1 to 2 halogen atoms or by a nitro group, or an aralkyl group of 7 to 17 carbon atoms which is unsubstituted or substituted by alkyl of 1 to 12 carbon atoms or by 1 to 2 halogen atoms or by a nitro group,

L represents NH_3, pyridine, water, CO, NO or a halogen atom, and

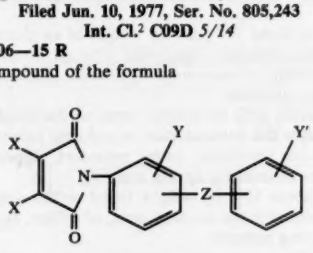
M if m is 4, represents Ni(O), Ni(I), Ni(II), Pd(II), Pt(II), Cu(I), Cu(II), Ag(I), Au(III), Zn(II), Cd(II), Hg(II), and if m is 6 represents Ti(III), V(II), V(III), Cr(I), Cr(II), Cr(III), Mn(I), Mn(II), Mn(III), Te(I), Re(I), Re(II), Re(III), Re(IV), Fe(II), Fe(III), Ru(II), Ru(III), Os(II), Co(I), Co(II), Co(III), Rh(III), Ir(III), Pt(IV), and if m is 8, represents Ti(III), Mo(IV), Mo(I), W(IV), W(V), Mn(IV) or (Re(V).

4,130,433
INDUSTRIAL BIOCIDES

Frank C. Becker, Gurnee, and Jorge P. Li, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

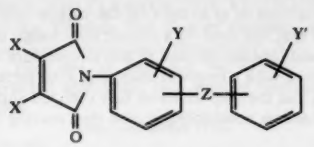
Filed Jun. 10, 1977, Ser. No. 805,243
Int. Cl.[2] C09D *5/14*
U.S. Cl. 106—15 R **15 Claims**

1. A compound of the formula



wherein substituents X both are either hydrogen or chlorine, Y represents 0–1 and Y′ represents 0–2 substituents taken from the group consisting of halogen, trifluoromethyl, alkoxy with 1–4 carbon atoms, nitro, carboxy and loweralkoxycarbonyl, and Z is O or S, with the proviso that when Z is O, at least one substituent Y or Y′ must be present.

9. The method of protecting a cellulosic, plastic or film-forming polymeric composition, knitted, woven, molded or extruded into a continuous form, against bacterial or fungal attack upon exposure to an environment containing common bacteria and fungi, comprising incorporating into said continuous form or coating said composition with a biocidally effective amount of a maleimide of the formula



wherein both substituents X are either hydrogen or chlorine, Y represents 0–2 and Y′ represents 0–2 substituents taken from the group consisting of halogen, trifluoromethyl, alkoxy with 1–4 carbon atoms, nitro, carboxy and loweralkoxycarbonyl, and Z is O or S, with the proviso that when Z is O, at least one substituent Y or Y′ must be present.

4,130,434
PAINT COMPOSITIONS

Francis W. Arbir, Itasca, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 763,390, Jan. 28, 1977, which is a continuation-in-part of Ser. No. 728,338, Sep. 30, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,594
Int. Cl.[2] C09D *5/14*
U.S. Cl. 106—15 R **6 Claims**

1. The process of preventing or reducing yellowing in paint compositions containing a biocide of the formula $R\text{-}SO_2\text{-}CHI_2$ wherein R is phenyl, alkylphenyl, benzyl, chlorobenzyl, dichlorobenzyl or an alkyl group of 2–8 carbons consisting essentially in adding to said paint composition between 0.25 and 5.0 lbs. per pound of said biocide of a phenylmercury acylate consisting essentially of a compound having the formula $R'\text{-}COOHgC_6H_5$ or $R''\text{-}(COOHgC_6H_5)_2$, wherein R is an alkyl group of 1–19 carbon atoms and R″ is an alkylene group of 2–18 carbon atoms, said alkyl or alkylene containing between 0 and 1 double bond.

4,130,435
PROCESS FOR PREPARING A BALL-POINT PEN INK

Ira L. Hall, Penns Grove, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 18, 1975, Ser. No. 614,687
Int. Cl.[2] C09D *11/18*
U.S. Cl. 106—22 **9 Claims**

1. Improved process for preparing a stable liquid dye solution which is of low inorganic salt content and which is directly useful as a ball-point pen ink, said process comprising admixing and reacting at 20°–80° C. approximately stoichiometric amounts of a water-soluble cationic dye and a water-soluble anionic dye in a liquid medium, which comprises a solvent for said water-soluble ionic dyes, to form a cationic-anionic dye salt which is substantially insoluble in water; without isolating the dye salt, dissolving said salt in the lower phase of a two-phase liquid medium comprising an upper aqueous phase and a lower ball-point pen ink solvent phase, said ball-point pen ink solvent being substantially insoluble in water, the two-phase liquid medium either being present during said admixing and reacting or being added subsequent to said admixing and reacting; and thereafter separating the aqueous and solvent phases which provides a stable liquid dye solution which is useful as a ball-point pen ink.

4,130,436
PROCESS FOR RECLAIMING FOUNDRY SAND WASTES

Karl V. Hauser, Ann Arbor, and Fred Mencenberg, Taylor, both of Mich., assignors to Edw. C. Levy Co., Detroit, Mich.

Filed May 11, 1977, Ser. No. 796,018
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.9 **4 Claims**

1. A method for reclaiming waste foundry molding sand having carbon and clay additives, comprising the steps of

heating said sand to a temperature range of 1400° to 1600° F. with air available so as to burn off the carbon additives, continuing to heat the sand to a temperature range of 1800° to 2200° F., and treating the sand in that temperature range for a specified time with a resultant change in sand surface characteristics in that the clay additives fuse onto the surface of the sand and become nonabsorptive, and then cooling the sand.

4,130,437

PHOTOCHROMIC GLASSES SUITABLE FOR SIMULTANEOUS HEAT TREATMENT AND SHAPING

Jean P. Mazeau, Avon, France, and Thomas P. Seward, III, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 12, 1978, Ser. No. 895,646
Int. Cl.[2] C03C *3/26, 3/08, 21/00*
U.S. Cl. 106—54 **12 Claims**

1. A glass composition consisting essentially, in weight percent on the oxide basis as calculated from the batch, of about 54–66% SiO_2, 7–15% Al_2O_3, 10–25% B_2O_3, 0.5–4% Li_2O, 3.5–15% Na_2O, 0–10% K_2O, 6–16% total of $Li_2O + Na_2O + K_2O$, 0–1.25% PbO, 0.1–0.3% Ag, 0.2–1% Cl, 0–0.3% Br, 0.002–0.02% CuO, and 0–2.5% F, having a viscosity at the liquidus of at least 10^4 poises, long term stability against devitrification in contact with platinum at temperatures corresponding to glass viscosities in the range of 10^4–10^6 poises, excellent chemical durability, and being chemically strengthenable to modulus of rupture values in excess of 45,000 psi with a depth of compression layer between about 0.0035–0.004 inch, said glass, in bodies of about 1.3–1.7 mm cross section, exhibiting the following photochromic properties:

(a) at about 25°–30° C. will darken to a luminous transmittance below 30% in the presence of actinic radiation; will fade to a luminous transmittance at least 1.75 times the darkened transmittance after 5 minutes' removal from the actinic radiation; and will fade to a luminous transmittance in excess of 80% of its clear luminous transmittance in no more than one hour after being removed from the actinic radiation;

(b) at about 40° C. will darken to a luminous transmittance below 50% in the presence of actinic radiation and will fade to a luminous transmittance in excess of 80% of its clear luminous transmittance in no more than one hour after being removed from the actinic radiation;

(c) at about −18° C. will not darken to a luminous transmittance below 5% in the presence of actinic radiation; and

(d) in the undarkened state will exhibit a luminous transmittance of at least 60%.

4,130,438

BASIC COMPOSITE UNBURNED BRICK

Akira Watanabe, Okayama; Yukio Kusaka, and Yoshihiro Suzuki, both of Bizen, all of Japan, assignors to Kyushu Taikarenga Kabushiki Kaisha, Bizen, Japan

Filed Nov. 23, 1977, Ser. No. 854,497
Claims priority, application Japan, Dec. 11, 1976, 51-149280
Int. Cl.[2] C04B *35/52*
U.S. Cl. 106—56 **4 Claims**

1. A composite unburned brick comprising:

a magnesia-carbonaceous refractory body portion; and

a basic refractory body portion integrally molded to one side of magnesia-carbonaceous refractory body portion.

4,130,439

METHOD OF PREPARING BATCH FOR MANUFACTURE OF CLAY BRICK

Stanislav I. Gashenko, ulitsa Gorkogo, 159, kv. 76; Alexandr A. Rogatkin, ulitsa 40 let Sovetskoi Ukrainy, 76, kv. 3; Grigory I. Silakov, ulitsa Yatsenko, 4a, kv. 59; Leonid P. Khlopkov, ulitsa 40 let Sovetskoi Ukrainy, 58, kv. 39, all of Zaporozhie; Sergei G. Nesterovsky, ulitsa D. Donskogo, 4a, kv. 9, Dnepropetrovsk; Andrei I. Starun, ulitsa Ogorodnaya, 91, Dnepropetrovsk; Viktor D. Mironov, ulitsa Kossiora, 1a, kv. 36, Dnepropetrovsk; Gennady D. Dibrov, ulitsa Poligonnaya, 18a, kv. 119, Dnepropetrovsk, and Anatoly A. Panasenko, prospekt Vorontsova, 75, kv. 299, Dnepropetrovsk, all of U.S.S.R.

Filed Feb. 24, 1977, Ser. No. 771,515
Int. Cl.[2] C04B *33/00*
U.S. Cl. 106—67 **5 Claims**

1. A method of preparing a batch of clay for the manufacture of clay bricks, wherein the properties of said batch are improved, which comprises mixing said clay with an aqueous solution of the chloride wastes of non-ferrous metallurgy in a quantity of 5–20 percent based on the weight of said clay, wherein said aqueous solution of chloride wastes is obtained by dissolving chloride wastes of non-ferrous metallurgy having a particle size of about 10–100 microns in water and adjusting the pH of the obtained solution to 1–5 and the density of 1.03–1.1 g./cc., depending on the mineralogical composition of the clay.

4,130,440

SELF-CURABLE INORGANIC COMPOSITION

Shinji Nose, Kobe, and Shingo Tokuda, Nishinomiya, both of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed Dec. 1, 1977, Ser. No. 856,324
Claims priority, application Japan, Nov. 8, 1977, 52-134367
Int. Cl.[2] C04B *35/16;* C09J *1/02*
U.S. Cl. 106—74 **9 Claims**

1. A self-curable inorganic composition consisting of

(A) an alkali silicate as a binder,

(B) about 30 to about 300% by weight, based on the solids content of the binder (A), of a hardener composed of

(i) 100 parts by weight of a compound selected from the group consisting of calcium sulfite and calcium thiosulfate,

(ii) about 50 to about 300 parts by weight of calcuim silicate,

(iii) about 40 to about 300 parts by weight of zinc oxide, and

(iv) 0 to about 150 parts by weight of an aluminum-containing inorganic compound selected from the group consisting of aluminum hydroxide, alumina and hydrated alumina,

(C) 0 to about 20% by weight, based on the weight of composition in the uncured state, of coloring agents, thickeners, water repellents, curing retarders, dispersants, defoamers or levelling agents, and

(D) 0 to about 80% by weight, based on the weight of the composition in the uncured state, of a filler, aggregate or reinforcing material.

4,130,441

CEMENT AND PROCESS FOR PRODUCING SAME

Boris I. Nudelman, Chilanzar, kvartal 8, 27, kv. 48; Alexandr S. Sventsitsky, Severo-Vostok, 50, kv. 64; Marsel Y. Bikbau, massiv Junus-Abad, B-2, 21, kv. 58; Ada M. Prikhozhan, F-100, Mukimi, 1, kv. 95, and Isak M. Ibragimov, ulitsa Biruni, proezd Temir-Tau, 38, all of Tashkent, U.S.S.R.

Filed Jul. 19, 1977, Ser. No. 817,035
Claims priority, application U.S.S.R., Aug. 20, 1976, 2397382
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—89 **2 Claims**

1. A cement consisting of

(a) clinker minerals, viz. a highly-basic calcium chlorosili-

cate, calcium ortho-chlorosilicate, calcium chloroaluminate, calcium chloroalumoferrite;

(b) calcium oxychloride;

(c) calcium chloride chemisorbed on said clinker materials, the components being present in the following proportions, percent by weight:

a highly basic calcium chlorosilicate	35 to 75
calcium chloro-orthosilicate	10 to 55
calcium chloroaluminate	2 to 30
calcium chloroaluminoferrite	4 to 16
calcium oxychloride	0.5 to 2
calcium chloride chemisorbed on said minerals	1.2 to 2.5

4,130,442

METHOD FOR RENEWING GROUT

Arthur W. Petersen, Chatham Township, Morris County; Arthur Cimiluca, Carlstadt, and Leonard Hirschberger, Marlboro, all of N.J., assignors to Frederick G. Schwarzmann, Kearny, N.J.

Filed Jun. 6, 1977, Ser. No. 803,843

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.[2] B08B *7/00*

U.S. Cl. 134—4 **5 Claims**

1. The method of renewing the surface of grout comprising applying a composition consisting essentially of an aqueous suspension of 0.1 to 10% by weight of a surfactant, 10 to 60% by weight on a dry basis of a water-soluble or water-dispersible organic binder which dries to a water resistant film and a pigment, the weight ratio of binding agent to pigment being 1:5 to 5:1 to the grout, allowing the composition to dry to form a water resistant film of the organic binding agent on the grout and removing excess composition from the tile.

4,130,443

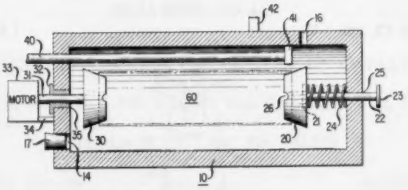
APPARATUS FOR CLEANING ROLLER APPLICATORS

Henry Dulin, 39 Washington Ave., Whippany, N.J. 07981

Filed May 17, 1977, Ser. No. 797,831

Int. Cl.[2] B08B *7/00, 3/00*

U.S. Cl. 134—33 **6 Claims**



1. Apparatus adapted for cleaning unmounted as well as mounted paint roller type applicators comprising:

a closeable container;

a first support means in said container for engaging a first end of an applicator whether or not said applicator is mounted on a handle assembly;

a second support means in said container for engaging a second end of said applicator whether or not said applicator is mounted on a handle assembly;

means in the interior of said container for spraying said applicator with solvent; and

means for rotating said applicator to cause contaminated solvent to be expelled from said applicator by centrifugal force.

4,130,444

DEVICE FOR CLEANING INK PEN POINTS

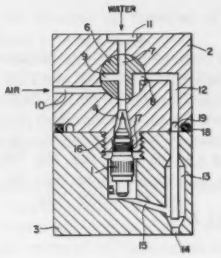
Gerold Anderka, Ellerbek, Fed. Rep. of Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Apr. 25, 1978, Ser. No. 900,046

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724888

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—96 **5 Claims**



1. A device for cleaning ink pen points comprising:

A. A housing having a lower section and an upper section;

i. said lower section defining:

a. a chamber for support and cleaning of an ink pen point and,

b. a jet pump communicable with said chamber, as well as a source of cleaning water and including a drain conduit;

ii. said upper section defining;

a. a lug like extension having an axial bore communicating with said chamber and complementally engagable at its exterior with the wall of said chamber;

b. an air inlet conduit communicating with said chamber in said lower section;

c. a water inlet conduit communicating with said jet pump in said lower section; and

d. a valve having water and air conduits therethrough, said valve being rotatably supported intermediate said air inlet conduit and said water inlet conduit in said upper section, so as to be rotatable from a water cleaning position in which said water conduit is aligned with said water inlet conduit and with said chamber, to an air drying position in which said air drying conduit is aligned with said air inlet conduit and with said chamber and said water conduit is aligned said water inlet conduit and with said jet pump.

4,130,445

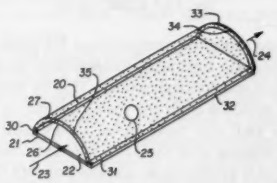
LIGHT COLLECTOR

Harry R. Blieden, Los Angeles, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 20, 1978, Ser. No. 888,095

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 PC **9 Claims**



1. A luminescent photovoltaic device comprising a curvilin-

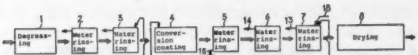
ear luminescent member having a plurality of sides, photovoltaic means on at least one of said sides, conduit means in heat exchange relationship with at least one of said sides, said conduit means being adapted to have a cooling fluid passed therethrough to cool said luminescent member.

4,130,446

PROCESS FOR PHOSPHATE CONVERSION COATING WITH TREATMENT OF RINSE WATER BY REVERSE OSMOSIS AND ION EXCHANGE

Ryoichi Murakami, Kyoto, and Masahiro Zinnouti, Kobe, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 19, 1977, Ser. No. 788,964
Claims priority, application Japan, Apr. 19, 1976, 51-45120
Int. Cl.[2] C23F *7/10*
U.S. Cl. 148—6.15 Z **4 Claims**



1. In a process for phosphating a substrate of iron or steel which comprises treating the substrate with a phosphating solution containing phosphate ions, zinc ions and, as an accelerator, at least one member selected from the group consisting of nitrite ions, chlorate ions and bromate ions, and rinsing the thus treated substrate with water in multiple steps, the improvement wherein a part of the rinsing water containing the phosphating solution rinsed from the surface of the substrate is passed through a reverse osmosis membrane having a pore size of 1 to 10 A to form a concentrate and a filtrate, the concentrate is recycled for use in the phosphating solution, and the filtrate is treated with ion-exchange resins of the H-type and the OH-type to remove undesirable ions therefrom and the thus treated filtrate is then recycled for use in the rinsing water.

4,130,447

ANNEALING SEPARATOR AND STEEL SHEET COATED WITH SAME

Edmondo Marianeschi; Sandro Basevi, both of Terni; Mario Barisoni, Albano Laziale (Rome); Paolo Marini; Carlo Borgianni, both of Rome, and Roberto Ricci Bitti, Lanuvio (Rome), all of Italy, assignors to Centro Sperimentale Metallurgico S.p.A. and Terni-Societa per l'Industria e l'Elettricita S.p.A., both of Rome, Italy

Filed Aug. 15, 1977, Ser. No. 824,611
Claims priority, application Italy, Apr. 27, 1977, 49142 A/77
Int. Cl.[2] B23K *35/24*
U.S. Cl. 148—27 **6 Claims**

1. Annealing separator compositions for grain-oriented silicon steel strip, said separator compositions having a magnesium oxide base and containing 0.8 to 35% by weight of at least one member selected from the group consisting of rare earth metal oxides and rare earth metal compounds which yield oxides upon heating, with the provision that when said at least one compound is present in an amount between 0.8 and 5% by weight, said compound has a particle size of less than 325 mesh, and a fraction of 35–55% by weight smaller than 500 mesh.

4,130,448

HIGH-PERMEABILITY MAGNETIC ALLOY

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Continuation of Ser. No. 694,969, Jun. 11, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 850,004
Claims priority, application Japan, Jun. 12, 1975, 50/70129
Int. Cl.[2] C22C *38/02, 38/04*
U.S. Cl. 148—31.57 **1 Claim**

1. A magnetic alloy body which has been rolled to reduce its thickness by at least 84.1% and consisting by weight essentially of 3 to 8% aluminum, 4 to 8% silicon, 0.1 to 1% of a component containing at least one element selected from the group which consists of niobium and tantalum and the balance iron in an amount of 85 to 92% by weight.

4,130,449

THICKENED AQUEOUS SLURRY EXPLOSIVE COMPOSITIONS

Joseph F. M. Craig, Beloeil, Canada, assignor to Canadian Industries Limited, Montreal, Canada

Filed May 22, 1978, Ser. No. 907,970
Claims priority, application Canada, Jun. 23, 1977, 281298
Int. Cl.[2] C06B *31/12*
U.S. Cl. 149—62 **6 Claims**

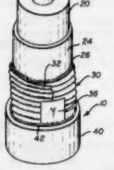
1. In a slurry explosive composition containing water, inorganic oxidizer salt, fuel, thickener, thickener cross-linker and, as a sensitizer, a soluble organic nitrate, the improvement comprising a thickener consisting essentially of a combination of unmodified guar gum and hydroxypropyl-modified guar gum, which thickener provides slurry composition viscosities suitable for extrusion packaging and which develops post-packaging viscosities resulting in firm, shape-retaining, tampable cartridges.

4,130,450

METHOD OF MAKING EXTRUDED SOLID DIELECTRIC HIGH VOLTAGE CABLE RESISTANT TO ELECTROCHEMICAL TREES

George Bahder, Edison; George S. Eager, Jr., Upper Montclair, and David A. Silver, Livingston, all of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Continuation-in-part of Ser. No. 631,314, Nov. 12, 1975, abandoned, which is a division of Ser. No. 467,607, May 6, 1974, Pat. No. 3,943,271. This application Apr. 6, 1977, Ser. No. 785,192
Int. Cl.[2] H01B *13/06*
U.S. Cl. 156—48 **7 Claims**



1. A method of making an insulated high-voltage power transmission cable resistant to the formation of electrochemical trees, which cable comprises a multi-stranded metal conductor comprising bare individual strands twisted together along helical paths, and a layer of extruded polyethylene insulation material surrounding the conductor, said insulation being subject to the formation of electrochemical trees starting at the inner surface of the insulation where the voltage stress in the insulation is at a maximum and from which said trees progress away from the inner surface and radially outward, comprising

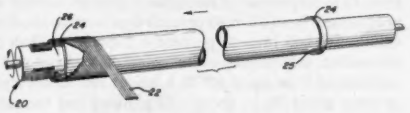
preventing air from entering the cable at the ends thereof by completely filling the spaces between the bare strands of the multistranded conductor and any space between the bare conductor strands and the inside surface of the insulation with a flexible sealant material to eliminate access of air to the inside surface of the extruded polyethylene insulation that surrounds the conductor, said sealant comprising a semi-conducting sealant having a drip point and characteristics required for high voltage power transmitting cables, providing a semi-conducting layer between the conductor and the inside surface of the insulation and maintaining a tight contact between the extruded insulation and such layers of the cable as are adjacent to the insulation to prevent access of air into the cable at the ends thereof.

4,130,451

PROCESS FOR THE MANUFACTURE OF FILAMENT WOUND PIPE USING DEFORMABLE MATERIAL AT THE WIND STOPS

Alan D. Hamilton, Aurora; Gregory P. Peterson, Carol Stream, and Walter R. McGuire, Aurora, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 29, 1977, Ser. No. 792,320
Int. Cl.² B65H *81/00*
U.S. Cl. 156—86 **5 Claims**



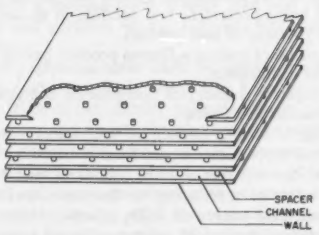
1. In a process for making filament wound pipe wherein filamentary roving is wound on a mandrel, a resin composition is used which decreases in volume during a cure and wherein at least one wind-stop is employed which prevents the pipe from relieving longitudinal stresses that arise during said cure, the improvement comprising fitting a deformable material to said wind-stop which is (1) capable of substantially withstanding the compressive forces arising during winding of said roving onto said mandrel and remaining substantially unaffected by any temperature occurring during manufacture of said pipe, (2) substantially inert to said resin composition and (3) adapted to yield to the compressive forces which arise during cure so as to relieve stresses and avoid creation of significant longitudinal strains.

4,130,452

PROCESS OF CONSTRUCTING A CERAMIC CATALYST SUPPORT

John L. Indri, Rte. #33 R.D. #1 Box 523, Hightstown, N.J. 08520

Filed May 10, 1977, Ser. No. 795,379
Int. Cl.² C04B *39/12*
U.S. Cl. 156—89 **30 Claims**



1. A method of making a ceramic device having a plurality of thin walls of microporous ceramic material separated by spacers possessing channels open at both ends and a large exposed internal surface area; said device suitable upon coating with appropriate catalyst for use in the catalytic conversion of harmful exhaust pollutants into innocuous materials; said method comprising the following steps:

i. coating a mixture containing a ceramic powder, a curable organic binder, and a liquid suspending medium onto a substrate sheet wherein the characteristics of said sheet allows it to be subsequently removed in later stages of the method;

ii. solidifying the coating by removal of the suspending medium to form a bicomponent sheet;

iii. assembling the bicomponent sheet into a structure by cutting the sheet into individual sheets and stacking these upon one another or by rolling said sheet upon itself to form a cylinder;

iv. forming a series of holes at right angles to the plane of the sheets;

v. filling the holes so formed with a mixture of ceramic powder in a curable organic binder;

vi. curing the organic binders of steps i. and v.;

vii. removing the material of the original substrate sheet;

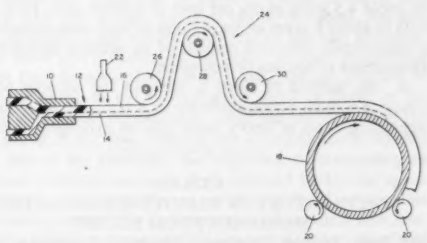
viii. heating to burn off the organic binder and fire the ceramic.

4,130,453

PIPE COATING METHOD AND APPARATUS

John H. Hollister, Acton, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 28, 1977, Ser. No. 819,973
Int. Cl.² B29C *19/00*
U.S. Cl. 156—187 **16 Claims**



1. Method of coating pipe which comprises

forming by extrusion a band of heat-softened thermoplastic,

cooling at least one surface of said band to decrease its fluidity and passing said cooled band through tension isolating means, and applying the surface of said band to the surface of said pipe while simultaneously rotating said pipe about its axis and advancing said pipe along its axis with respect to the point of extrusion to wrap said band helically about said pipe and to pull said band from said tension isolating means, said band being self-supporting and being maintained free from contact with external surfaces between said tension isolating means and said pipe surface and

controlling said tension isolating means and the rate of rotation and advance of said pipe with respect to the rate of extrusion to maintain a first tension on said band between the point of extrusion and the point of contact with the tension isolating means at substantially constant value and to maintain a second tension on said band between said tension isolating means and the contact of said band with said pipe surface at a value substantially higher than said first tension.

4,130,454
ETCHANT AND PROCESS OF ETCHING WITH THE SAME

Oleh B. Dutkewych, 54 Highland Ave., Maplewood, N.J. 07040; Charles A. Gaputis, 423 Maple Blvd., Apt. 3W, Kansas City, Mo. 64124; Michael Gulla, 24 Ivy La., Sherborn, Mass. 01770, and Leonard R. Levy, 6 Colonial Dr., Framingham, Mass. 01701

Continuation-in-part of Ser. No. 646,476, Jan. 5, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 822,002
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—659 **18 Claims**

11. An etchant comprising an oxidant combination in a sulfuric acid solution, said oxidant combination comprising hydrogen peroxide and molybdenum, the sulfuric acid concentration varying between 0.01 and 2.5 moles per liter, the hydrogen peroxide concentration varying between about 0.1 and 10 moles per liter, the molybdenum concentration varying between about 0.02 and 0.5 moles per liter and the ratio of the peroxide to the molybdenum being at least 1 to 1.

17. In a process for the manufacture of a printed circuit board including the steps of applying a resist over a copper cladding and removing unwanted copper by etching, the improvement comprising etching said unwanted copper with the etchant of claim **11** to leave a pattern of copper behind.

4,130,455
DISSOLUTION OF METALS-UTILIZING H_2O_2-H_2SO_4-THIOSULFATE ETCHANT

Moenes L. Elias, and Millard F. Good, both of Canfield, Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 8, 1977, Ser. No. 849,685
Int. Cl.[2] C09K *13/06*; C23F *1/00*
U.S. Cl. 156—666 **15 Claims**

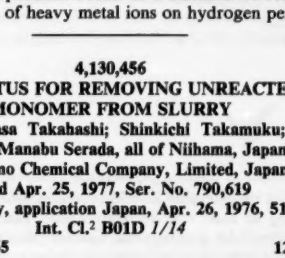
1. A method of metal dissolution which comprises contacting a metal with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide and a catalytically effective amount of an additive selected from thiosulfates of sodium or potassium.

4. The method of claim **1**, wherein the aqueous solution contains sodium phenolsulfonate as a stabilizer to reduce the degrading effect of heavy metal ions on hydrogen peroxide.

4,130,456
APPARATUS FOR REMOVING UNREACTED MONOMER FROM SLURRY

Iko Itoh; Tsukasa Takahashi; Shinkichi Takamuku; Azuma Aramaki, and Manabu Serada, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Apr. 25, 1977, Ser. No. 790,619
Claims priority, application Japan, Apr. 26, 1976, 51/48305
Int. Cl.[2] B01D *1/14*
U.S. Cl. 159—165 **12 Claims**



1. An apparatus for the removal of unreacted monomers from polymer suspension liquors or latices which comprises:

(a) a vessel partitioned into a plurality of vertically disposed, open topped compartments in the lower portion thereof;

(b) said vessel having a vertical revolving shaft at center thereof, said shaft comprising a feed inlet for said polymer suspension liquors or latices to be supplied therethrough, said feed inlet rotatably mounted above said open topped compartments so as to permit introduction of said polymer suspension liquors or latices into each of said open topped compartments;

(c) a gas outlet at upper part of said vessel; and

(d) said compartments each having a feed inlet for steam and/or an inert gas and an outlet at the bottom thereof.

4,130,457
METHOD OF PULPING WITH POLYSULFIDE

Richard G. Barker, Princeton Junction, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Continuation of Ser. No. 366,758, Jun. 4, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 533,193
Int. Cl.[2] D21C *3/04*
U.S. Cl. 162—82 **12 Claims**

1. A process for pulping lignocellulosic materials which comprises;

(a) impregnating said materials with a polysulfide pulping liquor having from 5 to 60 gms. per liter of sulfur where from 43 to 80 percent of the sulfur is present as alkali metal polysulfide, from 15 to 40 percent is present as alkali metal sulfide and less than 17 percent is present as alkali metal thiosulfate; said impregnation being carried out at a temperature of from about 60° C. to about 100° C. for a period of from about 30 to about 120 minutes and the ratio of pulping liquor to lignocellulosic material being at least 4.5:1.0 by weight;

(b) separating the impregnated materials from unabsorbed pulping liquor;

(c) steaming the separated materials to a temperature of between 140° C. and 165° C. in a period of less than 10 minutes; and

(d) maintaining the steamed and separated from unabsorbed pulping liqor materials at a temperature of from 140° C. to 165° C. until said materials are pulped.

4,130,458
PRODUCT CONTAINING ALUMINA TRIHYDRATE AND A SOURCE OF B_2O_3 AND METHOD

Gregory R. Moore, West Chicago, and Craig A. Fischer, Sycamore, both of Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation of Ser. No. 588,687, Jun. 20, 1975, abandoned. This application May 13, 1977, Ser. No. 796,509
Int. Cl.[2] D21H *3/66*
U.S. Cl. 162—159 **25 Claims**

1. A fibrous product comprising combustible fibers, an alumina hydrate in an amount in the range of 10–60% by weight of said product, and a boron containing compound selected from the group consisting of boric acid, mixture of boric acid and borax, and an ammonium borate, said borate containing compound being present in said product in an amount of at least ½% by weight of said product.

12. A method of making a fibrous product having a reduced flamespread comprising:

mixing together a slurry of components comprising water and combustible fibers,

depositing at least a portion of said slurry onto a water pervious support member to form a wet mat,

adding to the wet mat alumina trihydrate, and a source of B_2O_3 effective in reducing the flamespread of the fibrous product, said source of B_2O_3 selected from the group consisting of boric acid, mixture of boric acid and borax, and an ammonium borate, wherein said alumina trihydrate is added in an amount sufficient to provide 10–60% alumina trihydrate in said fibrous product and wherein said

source of B_2O_3 is added in an amount sufficient to provide at least ¼% B_2O_3 in said fibrous product, and consolidating the fibrous product.

4,130,459

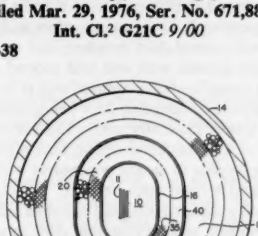
POISON AND DILUENT SYSTEM FOR NUCLEAR POWER PLANTS

Walter G. Parker, West Newton; Jack M. Ravets, Pleasant Hills, and Bruce S. Preble, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 29, 1976, Ser. No. 671,887

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—38 **11 Claims**



1. A dilution system for nuclear power plants comprising:

a nuclear core containing nuclear fuel, said fuel having a density and a melting point, said fuel emitting neutrons;

an inner wall encapsulating said nuclear core, said inner wall being of a material with a melting point less than said fuel melting point;

a pressure vessel encapsulating said inner wall, said pressure vessel being of a material with a melting point less than said fuel melting point, said pressure vessel and said inner wall forming an inner space therebetween;

an inner screen disposed within said inner space located adjacent said inner wall, said inner screen being of a material having a melting point greater than said fuel melting point, said inner screen having openings therein;

an inner layer of low-density particles disposed within said inner space, said inner layer being positioned adjacent said pressure vessel, said low-density particles being of a material with a melting point greater than said fuel melting point, said particles having a density less than said fuel density;

a generally spherical outer shield encapsulating said pressure vessel, said outer shield comprising a generally spherical outer layer of low-density pellets adjacent said containment vessel and a generally spherical outer screen coupled to said containment vessel, said outer screen being positioned radially inward of said outer layer of low-density pellets, said outer screen having openings of a size smaller than said low-density pellet size, said outer screen being of a material having a melting point greater than said fuel melting point; and

a generally spherical containment vessel encapsulating said outer shield.

4,130,460

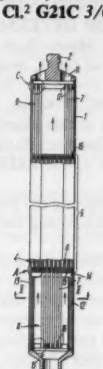
FUEL ASSEMBLY FOR FAST REACTOR

Vladimir G. Iljunin, ulitsa Zvezdnaya, 15, kv. 70; Viktor M. Murogov, ulitsa Lenina, 13/1, kv. 4; Mikhail F. Troyanov, ulitsa Lenina, 36a, kv. 30; Anatoly A. Rineisky, ulitsa Lyashenko, 2, kv. 35; Gennady G. Ustinov, ulitsa Koroleva, 18, kv. 18, all of Obninsk Kaluzhskoi oblasti, and Anatoly N. Shmelev, Proletarsky prospekt, 77, kv. 96, Moscow, all of U.S.S.R.

Filed Apr. 6, 1977, Ser. No. 785,053

Int. Cl.[2] G21C *3/02*

U.S. Cl. 176—68 **12 Claims**



1. In an improved fuel assembly for a fast-neutron nuclear reactor comprising a shroud, an upstream end, a downstream end and a plurality of fuel elements each having an individual gas plenum for collection of gaseous fission products and divided into two groups; an inner group including fuel elements adjacent to the longitudinal axis of the fuel assembly, and an outer group occupying the space between said shroud and the fuel elements of said inner group, the gas plenums of said inner group of the fuel elements being arranged at the coolant inlet side of the assembly, while the gas plenums of the outer group of the fuel elements are arranged at the coolant outlet side of the assembly, the improvement comprising an additional partition means or shell disposed within the space between the wall of said shroud and the bundle of gas plenums of said inner group of the fuel elements at the coolant inlet side, and said partition means or shell is connected to the wall of said shroud at the coolant inlet side to form a coolant stagnation zone open at the assembly fission zone; whereby stresses in the wall of said shroud are reduced.

4,130,461

CONTINUOUS PROCESS FOR THE PRODUCTION OF POLYSACCHARIDE UNDER PHOSPHATE LIMITING CONDITIONS

Renton C. Righelato, and Lynda Deavin, both of Reading, England, assignors to Tate & Lyle Limited, London, England

Filed May 20, 1977, Ser. No. 798,762

Claims priority, application United Kingdom, May 28, 1976, 22318/76

Int. Cl.[2] C12D *13/04*

U.S. Cl. 195—31 P **5 Claims**

1. In a process for the production of a polysaccharide comprising subjecting to continuous cultivation a bacterium of the species *Azotobacter vinelandii* under aerobic conditions to allow an oxygen uptake in an aqueous culture medium containing as essential ingredients at least one monosaccharide or disaccharide as carbon source and sources of phosphate, molybdenum, iron, magnesium, potassium, sodium, calcium and sulphate, said medium being provided with a source of nitrogen selected from the group consisting of a fixed nitrogen source and gase-

ous nitrogen, and recovering the resulting polysaccharide the improvement which comprises maintaining the concentration of phosphate in the medium such that it limits the concentration of the bacteria and is at least 1.0 millimolar, and maintaining the pH of the medium during cultivation within the range of about 6.0 to about 8.2.

4,130,462

RECEPTOR STERIC HINDRANCE IMMUNOASSAY FOR RECEPTOR DETERMINATION

Kenneth E. Rubenstein, Menlo Park, and Richard K. Leute, Mountain View, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Dec. 16, 1976, Ser. No. 751,805

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Int. Cl.[2] **G01N** *31/14;* **A61K** *39/00, 43/00*

U.S. Cl. 195—103.5 A **13 Claims**

1. A method for determining the presence of antiligand in an unknown suspected of containing said antiligand which comprises:

combining in an aqueous medium said unknown, anti(detector ligand) and reagent, wherein said reagent has a pair of epitopes in close proximity so that simultaneous binding of receptors to said pair of epitopes is sterically inhibited, wherein one of said pair of epitopes is recognized by said antiligand and the other said pair of epitopes is recognized by said anti(detector ligand);

determining by a detectant the amount of remaining unbound anti(detector ligand) or anti(detector ligand) bound to reagent; and

determining the presence of antiligand by comparing said amount determined with the amount determined with a medium having a known amount of antiligand.

4,130,463

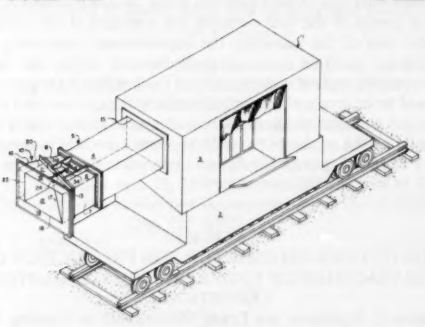
DUCT SWIVEL JOINT

Samuel N. Klavir, Bellmore, N.Y., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Aug. 10, 1977, Ser. No. 823,256

Int. Cl.[2] **C10B** *27/06, 33/00;* **F16L** *27/12*

U.S. Cl. 202—263 **2 Claims**



1. In a gas cleaning system including first and second vehicles mechanically coupled together in spaced-apart relationship, where the first vehicle is adapted to receive coke from a coking oven and the second vehicle contains gas cleaning equipment to clean fumes from coke received by the first vehicle, improved apparatus for effecting gaseous flow communication for the fumes between said vehicles comprising:

a. a first duct means including:

(i) a first open-ended, rigid duct member fixed at one of its ends in gaseous flow communication with the interior of the first vehicle; and

(ii) a first rigid coupling duct having an inlet end and an outlet end; said coupling duct being pivotably mounted to said first duct member so that its inlet end is in sealed, gaseous flow communication with the opposite end of said first duct member; said first coupling duct having an arcuate wall and said first duct member having a complimentary arcuate wall at its said opposite end; said first coupling duct being mounted to pivot about a single, generally vertical axis so that said arcuate wall of said first coupling duct is pivotably movable side-by-side in an arc concentric with said arcuate wall of said first duct member;

b. first biasing means connected between said first duct member and said first coupling duct to urge said coupling duct to pivot about said vertical axis;

c. a first frame member fixed to circumferentially surround the outlet end of said first coupling duct to provide a first planar bearing surface perpendicular to said outlet end;

d. a second duct means including:

(i) a second open-ended, rigid duct member fixed at one of its ends in gaseous flow communication with the interior of the second vehicle; and

(ii) a second rigid coupling duct having an inlet end and an outlet end; said coupling duct being pivotably mounted to said second duct member so that its inlet end is in sealed, gaseous flow communication with the opposite end of said second duct member; said second coupling having an arcuate wall and said second duct member having a complimentary arcuate wall at its said opposite end; said second coupling duct being mounted to pivot about a single, generally vertical axis so that said arcuate wall of said second coupling duct is pivotably movable side-by-side in an arc concentric with said arcuate wall of said second duct member;

e. second biasing means connected between said second duct member and said second coupling duct to urge said coupling duct to pivot about said vertical axis;

f. a second frame member fixed to circumferentially surround the outlet end of said second coupling duct to present a second planar bearing surface perpendicular to said outlet end of said second coupling duct; said first and second rigid duct members being located so that, when the first and second vehicles are coupled together, said first and second coupling ducts normally pivot in opposite directions so that said first and second frame members present mating faces which are in abutting and sliding engagement, one with the other, under the urging of said first and second biasing means to provide sealed gaseous flow communication between the first and second vehicles.

4,130,464

METHOD OF EVALUATING THE CORROSION RATES OF METALS

Kenichi Kanno; Masayuki Suzuki, both of Yokohama, and Yuichi Sato, Atsugi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 18, 1977, Ser. No. 798,168

Claims priority, application Japan, May 18, 1976, 51-56076; Oct. 22, 1976, 51-127016

Int. Cl.[2] **G01N** *27/46, 27/30*

U.S. Cl. 204—1 T **6 Claims**

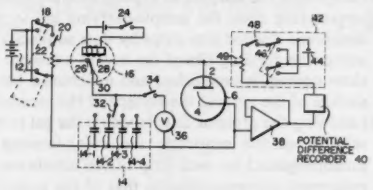
1. A method of evaluating the corrosion rate of metal in corrosive solution comprising:

feeding a given amount of charge q to the electrical double layer of a metal test piece having a given area S disposed in corrosive solution, said metal test piece being corroded to emit metal ions in the corrosion solution;

measuring the amount of polarization potential η_t of said metal test piece, the amount of which potential sharply increases due to the application of the given amount of charge and which gradually decays due to the corrosion reaction back to the open circuit electrode potential measured versus a reference electrode disposed with said test metal piece in said corrosive solution, said amount of

polarization potential being measured as a function of time;

calculating the initial polarization potential η_0 at time $t = 0$ after the cessation of said charge feeding from a plot of said polarization potential η_t measured as a function of time, and



deriving the polarization resistance R_p which is inversely proportional to the corrosion rate from said initial amount of polarization potential η_0 and the charge q fed to said metal test piece;

whereby the corrosion rate of the metal is calculated by means of said polarization resistance R_p.

4,130,465

TREATMENT OF CARBON FIBERS

Kojiro Arai, Okayama, and Noriaki Sugai, Fukuoka, both of Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Mar. 1, 1978, Ser. No. 882,890
Claims priority, application Japan, Mar. 30, 1977, 52-36839
Int. Cl.[2] C25D *7/00, 11/00*
U.S. Cl. 204—27 **10 Claims**

1. A method of treating carbon fibers characterized by supplying carbon fibers into an aqueous electrolytic solution comprising a vinyl monomer, said carbon fibers being negatively charged so that they act as the cathode thereby causing a polymerization reaction to occur on the surface of said carbon fibers uniformly covering them with the polymerization product of said polymerization reaction.

4,130,466

ANTIFOULING COATING FOR ALUMINUM STRUCTURES

Irvin R. Kramer, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 31, 1978, Ser. No. 911,267
Int. Cl.[2] C25D *5/48;* **B32B** *15/08*
U.S. Cl. 204—38 A **9 Claims**

1. A process for protecting aluminum objects from fouling, comprising the steps of:

anodizing the surface of the object exposed to fouling to produce a porous oxide layer thereon; and

impregnating said oxide layer with a molten antifouling compound selected from the group consisting of tributyltin, tripropyltin esters of vinyl, polymers of tributyltin, tripropyltin esters of acrylic acids, and tripropyltin esters of methacrylic acids.

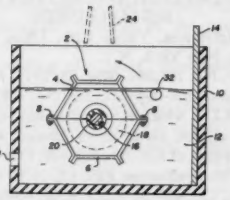
4,130,467

PROCESS FOR PLATING LEAD DIOXIDE

Klaus H. Oehr, Surrey, Canada, assignor to British Columbia Research Council, Vancouver, Canada

Continuation-in-part of Ser. No. 774,673, Mar. 7, 1977, abandoned. This application Apr. 21, 1978, Ser. No. 898,826
Int. Cl.[2] C25B *1/30*
U.S. Cl. 204—57 **10 Claims**

1. A method of completely coating a plurality of substrates with lead dioxide by electrolysis while the substrates are immersed in an electrolyte containing a lead salt, each substrate having curved surfaces and being able to roll freely, comprising tumbling the substrates in a porous barrel rotating about a central anode feeder at a speed of three to eight revolutions per minute with substrates contacting the anode feeder throughout the electrolysis, the anode feeder being of a material that does not dissolve or passivate in the electrolyte under the reaction



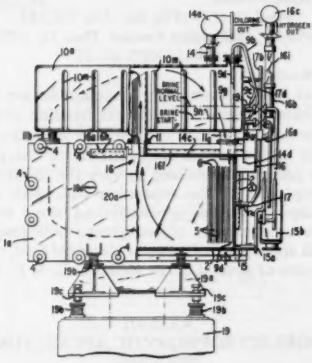
conditions during the elecrolysis, maintaining the temperature during the electrolsis at less than 70° C., applying a positive current to the anode feeder to maintain an anode current density in the range 1 to 8 milliamps per square centimeter throughout the electrolysis and applying a negative current to a cathode spaced from the anode.

4,130,468

METHOD OF OPERATION OF AN ELECTROLYSIS CELL WITH VERTICAL ANODES AND CATHODES

Oronzio De Nora, Milan, Italy, and Vittorio De Nora, Nassau, The Bahamas, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 655,493, Feb. 5, 1976, Pat. No. 4,073,715. This application Dec. 15, 1977, Ser. No. 860,679
Claims priority, application Italy, Nov. 28, 1975, 29782 A/75
Int. Cl.[2] C25B *1/34, 9/00, 11/03*
U.S. Cl. 204—98 **10 Claims**



1. In an electrolysis cell unit having a diaphragm separating said cell unit into an anode compartment and a cathode compartment, metal anodes in hollow finger form in said anode compartment, nested with cathodes in hollow finger form in said cathode compartment, the bases of said anodes being mounted in a support wall spaced from the anode compartment end wall of said cell unit, an electrolyte in said cell unit, means in said support wall to permit restricted flow of electrolyte therethrough, means to feed electrolyte into said cell unit and means to pass an electrolysis current through said cell unit, the method which comprises circulating the said electrolyte upwardly in the electrolysis gap between said anodes and cathodes and in the interior of said hollow fingers of said anodes by the lifting effect of the anodic gases formed in the electrolysis, separating the gases from the electrolyte and passing a portion of said electrolyte downward in the space between the anode support wall at the base of said anodes and the anode compart-

ment end wall to circulate said anolyte upwardly in the front of said anode support wall and downwardly in the rear of said anode support wall.

4,130,469

AQUEOUS COATING COMPOSITION FROM A MERCAPTAN CONTAINING POLYMER AND A BIS-MALEIMIDE

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 781,549, Mar. 28, 1977, Pat. No. 4,094,843, which is a continuation-in-part of Ser. No. 708,106, Jul. 23, 1976, Pat. No. 4,035,272, which is a continuation-in-part of Ser. No. 595,448, Jul. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 519,409, Oct. 31, 1974, Pat. No. 3,925,181. This application Feb. 13, 1978, Ser. No. 877,021

Int. Cl.[2] 427 *54;* C08F *8/00;* C08J *3/00*

U.S. Cl. 204—159.16 **9 Claims**

1. A coating composition in aqueous dispersion for forming an ultraviolet radiaton curable film thereof, which comprises:
   a water-dispersed polymer having at least about 5% by weight pendant mercaptan groups;
   at least about 5% by weight of said polymer of a bis-maleimide cross-linking agent; and
   at least about 0.5% by weight of said polymer of an ultraviolet photosensitizer,
   said bis-maleimide having alpha-, beta-ethylenic unsaturation for cross-linking said polymer through said marcaptan groups by addition polymerization upon subsequent ultraviolet radiation curing of said curable film.

4,130,470

METHOD FOR GENERATING A pH-FUNCTION FOR USE IN ELECTROPHORESIS

Ake Rosengren, Enskede; Bengt Bjellqvist, Stockholm, and Vesna Gasparic, Nacka, all of Sweden, assignors to Aminkemi AB, Bromma, Sweden

Filed Dec. 7, 1976, Ser. No. 748,184

Claims priority, application Sweden, Dec. 12, 1975, 7514049

Int. Cl.[2] G01N *27/26*

U.S. Cl. 204—180 G **14 Claims**

1. Method for generating a pH function for use in electrophoresis, characterized in that the pH function at least along parts of the separation path is generated from the protolysis equilibriums with the separation medium of charged and/or chargeable groups immobilized to vary the pH function in a matrix along parts of the separation path with chemically affixed groups of various concentrations along said path to thereby prevent transport of said groups with respect to the matrix upon application of an outer electrical field, said groups containing one or several of the elements C, S, P, B or N.

4,130,471

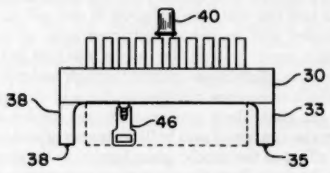
MICROELECTROPHORETIC APPARATUS AND PROCESS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Benjamin W. Grunbaum, Moraga, Calif.

Filed Nov. 10, 1977, Ser. No. 850,507

Int. Cl.[2] G01N *27/26*

U.S. Cl. 204—180 G **14 Claims**



1. A microelectrophoretic process for the simultaneous separation and identification of the components of two or more protein systems, comprising:
   (a) applying an unknown protein sample of a protein system different in nature or in origin and a standard protein sample for the system selected to each compartment of a shallow rib-divided tray containing a suitable gel;
   (b) subjecting the samples so applied to electrophoresis;
   (c) overlaying upon the sample-carrying gel in the tray a membrane divided into strips by slots so placed that they accept the dividing ribs of the tray in a manner such that close contact is established and maintained between the surface of the gel and the surface of the membrane;
   (d) allowing the proteins distributed on the gel to react with suitable specific substrates and color-forming reagents preimpregnated on each strip of the membrane in an arrangement corresponding to that of the protein systems located in the individual compartments of the gel; and
   (e) removing and drying the membrane to produce a composite electrophoretogram.

4,130,472

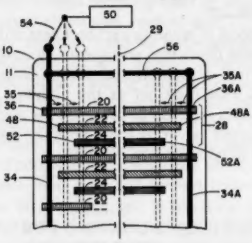
PROCESS FOR MAKING COLOR TELEVISION SCREENS BY ELECTROPHORETIC DEPOSITION

Sam H. Kaplan, Chicago; Philomena C. Libman, Mt. Prospect, and William E. Wainscott, Rockford, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 28, 1978, Ser. No. 891,098

Int. Cl.[2] C25D *13/02, 13/16*

U.S. Cl. 204—181 N **3 Claims**



1. For use in the production of a striped-screen television image display faceplate, a process for electrophoretically depositing patterns of image-related compounds on said faceplate, the process comprising:
   depositing a pattern of groups of periodically repeating electrically conductive stripes on said faceplate, said stripes in said groups being of a predetermined graduated length from relatively long to relatively short;
   electrically exciting by means of conductive contact strips with a charge of a first polarity both ends of said relatively long stripes during immersion of said faceplate in an electrolytic bath including an image-related compound having particles charged with a potential of a second polarity opposite to said polarity for electrophoretic deposition of said particles on said stripes;
   serially electrically exciting both ends of stripes of successively shorter lengths, accompanying each such exciting with a different bath including a different image-related compound for electrophoretic deposition on the respective stripes;
   whereby, by electrically contacting both ends of said conductive stripes, the effect of a single discontinuity in electrical conductivity of any of said stripes is nullified as any stripe having such a discontinuity is electrophoretically coated along its entire length with said compound.

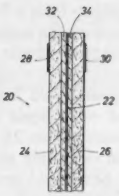
4,130,473
ELECTRODE STRUCTURE FOR USE IN METAL IN EXCHANGE APPARATUS USEFUL IN PURIFYING SPENT ACIDS AND THE LIKE

William L. Eddleman, 6638 Westchester, Houston, Tex. 77005

Continuation-in-part of Ser. No. 664,240, Mar. 5, 1976, abandoned. This application Jun. 27, 1977, Ser. No. 810,494

Int. Cl.[2] **C25C** *1/00, 7/00, 7/02, 7/04*

U.S. Cl. 204—252 **9 Claims**



1. An apparatus for use in electrically separating metal ions and acid cations in an aqueous solution, comprising:

a diaphragm which is:

(a) cation and anion permeable;

(b) impermeable to water;

(c) provided with two sides and has a thickness of about one mil;

(d) acid resistant;

(e) a flexible sheet to enable rolling into a tube from sheet stock;

(f) has exposed sides accepting an adhesive at least sufficient to attach an electrode thereto;

two electrodes formed of a flexible matted fibrous body impregnated with an electrically conductive material, one of said electrodes attached to one side of said diaphragm and the other attached to the opposite side of said diaphragm; and

means for connecting said electrodes in a DC circuit so that, on contact of said diaphragm with a solution of metal anions and acid cations, either the metal anions or acid cations move across said diaphragm dependent on current flow and the respective polarities of said electrodes.

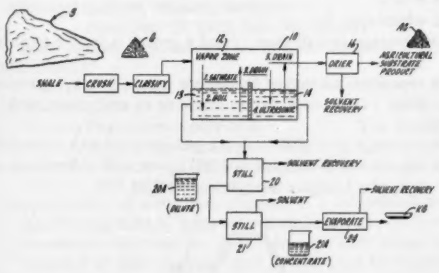
4,130,474
LOW-TEMPERATURE OIL SHALE AND TAR SAND EXTRACTION PROCESS

Myron L. Anthony, LaGrange, Ill., assignor to Shoilco, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 570,007, Apr. 21, 1974, abandoned. This application Jun. 9, 1976, Ser. No. 694,231

Int. Cl.[2] **C10G** *1/04;* **C05D** *1/00*

U.S. Cl. 208—11 LE **43 Claims**



1. The process of treating oil shale, reduced to particulate granular form, to produce at least two usable products, one being an unconverted organic extract principally kerogen which contains shale oil and the other a dross suitable as an agricultural substrate, comprising the following steps:

A. Treating the particulate shale with a hot perchloroethylene solvent in which kerogen is soluble at a temperature below 350° F. and at a temperature of not more than about 350° F. for a time sufficient to extract a substantial kerogenous fraction from the particulate shale without converting any appreciable part of the kerogen while leaving an unextracted inorganic residue in the particulate shale having a water soluble fertilizer constituent selected from the group consisting of nitrates, phosphates, potash and water soluble trace minerals;

B. Separating the kerogenous fraction and solvent from the treated particulate shale, leaving a granular dross in the form of a granular water-permeable substrate material which will support plant life;

C. Distilling said fraction and solvent to separate said fraction leaving the solvent in substantially pure form which is recycled to step A; and

D. At least partly separating the fertilizer constituent from the granular dross.

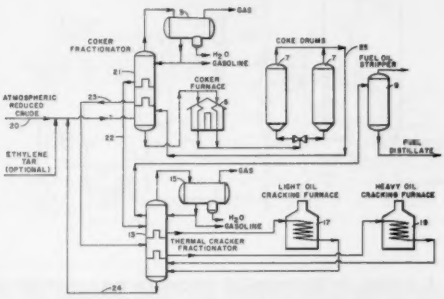
4,130,475
PROCESS FOR MAKING PREMIUM COKE

Daniel F. Cameron, London; Gary C. Hughes, Louth, both of England, and Harry R. Janssen, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 398,372, Sep. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 261,871, Jun. 12, 1972, abandoned. This application Nov. 10, 1977, Ser. No. 850,176

Int. Cl.[2] **C10G** *9/14, 37/02*

U.S. Cl. 208—54 **7 Claims**



1. A process for producing premium coke from an atmospheric reduced crude feedstock comprising:

(a) charging a feedstock of from 90 to 100 volume percent of an atmospheric reduced crude and up to 10 volume percent ethylene tar to a coker fractionator, said atmospheric reduced crude having an API gravity of from 20 to 30, a Conradson carbon residue of no more than 6.0 percent, and a boiling distribution as follows:

Volume Percent	Temperature - ° F
5	450–700
10	500–750
20	570–820
30	630–880
40	670–940
50	720–990
60	900+

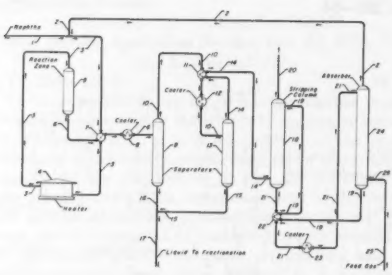
(b) charging a bottom stream from said coker fractionator to a coker furnace and heating said bottom stream to coking temperature;
(c) charging said heated bottom stream to a coking drum maintained at premium coking conditions to produce premium coke therein;
(d) passing overhead vapors from said coking drum to said coker fractionator;
(e) withdrawing gas oil from said coker fractionator and charging it to a thermal cracking unit where it is thermally cracked in thermal cracking furnace means to produce an effluent thermally cracked material including thermal tar;
(f) passing effluent from said thermal cracking furnace means to a thermal cracker fractionator;
(g) withdrawing thermal tar from said thermal cracker fractionator and combining said thermal tar and said atmospheric reduced crude; and
(h) recovering premium coke from said coke drum, said premium coke being the sole coke product produced in said process.

4,130,476

SEPARATION AND USE OF A GASEOUS STRIPPING MEDIA IN A HYDROTREATING PROCESS

Robert S. Loboda, Hacienda Heights, Calif., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 706,858, Jul. 19, 1976, Pat. No. 4,058,452. This application Aug. 11, 1977, Ser. No. 823,774
Int. Cl.[2] C10G *23/02, 34/00*
U.S. Cl. 208—212 **5 Claims**



1. A catalytic hydrotreating process having a once-through hydrogen gas flow which comprises the steps of:
(a) passing a feed gas stream comprising hydrogen and C_2 to C_4 paraffins through an absorption zone operated under conditions effective to remove C_2 to C_4 paraffins from said gas stream, including countercurrent contact of said gas stream with a stripping zone liquid effluent stream thereby forming a hydrogen-rich gas stream and an absorption zone liquid effluent stream;
(b) passing the absorption zone liquid effluent stream into a stripping zone operated at conditions effective to cause the removal of C_2 to C_4 paraffins from said absorption zone liquid effluent stream, including countercurrent contact with a gaseous stripping media, as hereinafter delineated, thereby forming said stripping zone liquid effluent stream of step (a) and an off-gas stream comprising hydrogen and C_2 to C_4 paraffins;
(c) admixing the hydrogen-rich gas stream of step (a) with a hydrocarbon fraction to form a reaction zone feed stream;
(d) passing said reaction zone feed stream through a catalytic hydrotreating zone containing a catalyst comprising a metal or oxide of a metal selected from the group consisting of Group VIII, Group VIB, and the combination of Group VIB and Group VIII of the Periodic Table to treat said hydrocarbon with said hydrogen to form a catalytic hydrotreating reaction zone effluent;
(e) cooling and effecting a partial condensation of said reaction zone effluent and passing said effluent into a first vapor-liquid separation zone operated at a temperature of from about 20° F. to 300° F. and a pressure of about 100 psig to about 1500 psig to form a first condensate stream and a first separation zone gas stream;
(f) passing said first condensate stream to a product recovery zone;
(g) cooling and then passing said first separation zone gas stream into a second vapor-liquid separation zone operated at a lower pressure within 25 psi of the pressure of said first vapor-liquid separation zone and a temperature about 40° to 100° F. below said temperature of said first-liquid separation zone to form a second condensate stream and a second separation zone gas stream;
(h) heating the second separation zone gas stream by indirect heat exchange to provide said cooling of said first separation zone gas stream in step (g) and passing said heated second separation zone gas stream into a lower porton of the stripping zone as the gaseous stripping media in step (b); and
(i) passing said second condensate stream to said product recovery zone.

4,130,477

FROTH FLOTATION PROCESS

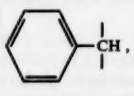
Donald M. Podobnik, Cuajone, Peru, and Guy H. Harris, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 754,764, Dec. 27, 1976, abandoned. This application Dec. 21, 1977, Ser. No. 862,998
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **22 Claims**

1. In a process for collecting mineral values from an ore which comprises mixing ground ore with water to form an ore pulp and aerating said pulp in the presence of an effective amount of a frother, the improvement which comprises carrying out said process with a frother of the formula:

$$R[S(EO)_x(PO)_y(BO)_z H]_n$$

wherein, in said formula,
EO = C_2H_4O, PO = C_3H_6O and BO = C_4H_8O,
n = 1 or 2,
x = 0–4,
y = 1–10,
z = 0–2,
and where n = 1,
the average sum of the x, y and z groups is from 2 to about 12,
R represents alkenyl of 3–5 carbon atoms, an alkyl group of from 1 to about 8 carbon atoms or an aryl group, and
where n = 2
the average sum of all x+y+z groups is from 2 to about 12,
R represents, a bridging $-(CH_2)_m-$radical wherein m = 1–6, or a bridging benzylidene radical

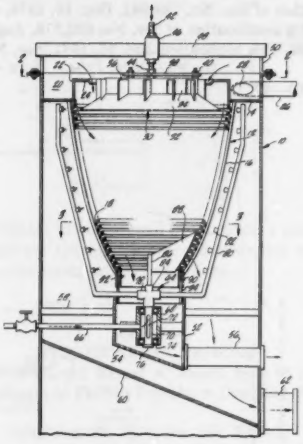


or frother mixtures of the above formula.

4,130,478
BOWL SHAPED SCREENING APPARATUS

Douglas M. Swallow, Toronto, Canada, assignor to Sweco, Inc., Los Angeles, Calif.

Filed Aug. 25, 1977, Ser. No. 827,461
Int. Cl.[2] B07B 1/06
U.S. Cl. 209—254 3 Claims



1. A screening apparatus having a support structure, a stationary screen fixedly mounted in said support structure, said screen being bowl-shaped with a first opening centrally located at the upper end thereof and a second, smaller opening centrally located at the lower end thereof, an influent passage located near the top of said support structure, an effluent receiver about said screen and a concentrate receiver below said second opening; wherein the improvement comprises, in combination,

an influent manifold having an annular channel, a tangential inlet for said influent passage and an inner wall defining one side of said annular channel and extending to an edge over which influent can flow towards said screen;

a distributor cone mounted to said support structure and positioned in said first opening to receive influent from said influent manifold and distribute the influent outwardly and downwardly to said screen, said distributor cone extending to near said screen forming an annular orifice therebetween; and

means for rotatably mounting said cone to said support structure.

4,130,479
REPLACEABLE LINER FOR CENTRIFUGE SIEVE

Herbert Schiele, Kettwig, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

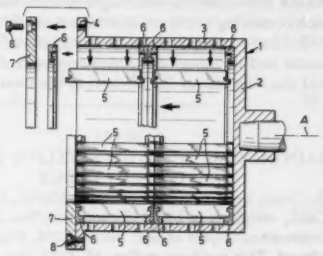
Filed Dec. 17, 1975, Ser. No. 641,621
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1974, 2460167
Int. Cl.[2] B07B 1/46
U.S. Cl. 209—395 7 Claims

1. A centrifuge sieve comprising:

a support drum rotatable about an axis;

a pair of axially spaced rings secured in said drum and centered on said axis; and

a multiplicity of sieve bars disposed in a cylindrical array and having radially inner sides defining a sieve surface of revolution centered on said axis, said bars being held together at their opposite ends by said ring by engaging same with a shape-locking plug-in connection, each of said plug-in connections comprising an element on the respective bar and a mating element on the respective ring, the mating elements interengaging in a claw-like manner, both of said rings and all of said elements being totally outside said surface, each of said bars being formed at each of its ends with a laterally extending projection engageable with the adjacent end of the adjacent bar and serving to space

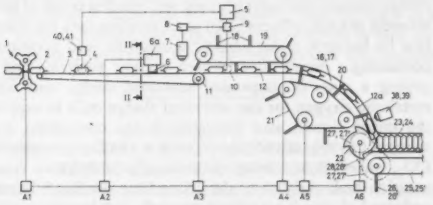


said bars circumferentially apart, said projections being radially inward and axially aligned with said rings to shield same, each of said projections having a radially inner surface radially outwardly of said body.

4,130,480
APPARATUS FOR SORTING, COUNTING AND GROUPING ITEMS

Horst Loewenthal, Tiengen, Fed. Rep. of Germany, assignor to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 16, 1977, Ser. No. 797,399
Claims priority, application Switzerland, May 14, 1976, 6092/76
Int. Cl.[2] B07C 5/38
U.S. Cl. 209—551 17 Claims



1. An apparatus for sorting, counting and grouping items, including conveyor means, defining a conveying path, for advancing the items in succession, comprising

(a) sorting means disposed along said conveying path for removing defective items and including a pusher device supported along said conveying path for periodical movement transversely to said conveying path between successive items for laterally removing interconnected successive items from said conveyor means;

(b) counting means disposed along said conveying path downstream of said sorting means for counting the advancing items unaffected by said sorting means;

(c) at least two branch conveyors forming part of said conveyor means and defining said conveying path downstream of said counting means;

(d) a routing device arranged along said conveying path upstream of the branch conveyors and downstream of said counting means for directing the items onto a selected one of said branch conveyors; said counting means being

connected to said routing device for switching said routing device upon reaching a predetermined count for alternatingly directing a predetermined number of items onto separate branch conveyors;

(e) stacking means arranged at downstream ends of said branch conveyors for stacking the items into item groups each consisting of the predetermined number of items; and

(f) collecting conveyor means forming part of said conveyor means and defining said conveying path downstream of said stacking means for advancing the item groups.

4,130,481

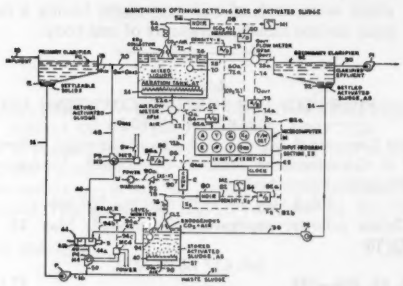
MAINTAINING OPTIMUM SETTLING RATE OF ACTIVATED SLUDGE

Lee M. Chase, Los Gatos, and Julius J. Muray, Los Altos, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 768,255, Feb. 14, 1977, abandoned. This application Sep. 16, 1977, Ser. No. 833,923

Int. Cl.[2] C02C *1/06, 5/10*

U.S. Cl. 210—6 **6 Claims**



5. The method of maintaining the optimum settling rate of the activated sludge in the secondary clarifier of an activated sludge sewage treatment process; said process being of the type wherein sewage influent is fed to an aeration tank for consumption by bacteria under aerobic conditions, said aeration tank containing a mixed liquor water, organic substrate and comprising a mass of suspended activated sludge and wherein metabolic oxygen for the activated sludge cells in supplied to the mixed liquor, said activated sludge consuming organic substrate in the mixed liquor with a resultant respiration of CO_2, mixed liquor being continuously withdrawn from the aeration tank and fed to the secondary clarifier wherein the activated sludge is permitted to settle out leaving a clarified effluent and a portion of the settled activated sludge is returned to the aeration tank; the improvement comprising the steps of continuously measuring the actual density of the mass of activated sludge in the aeration tank; continuously collecting the gases leaving a predetermined area of the surface of said mixed liquor, continuously measuring the percentage of CO_2 in said collected gases, continuously determining the volume of CO_2 collected during a given period of time as an index of the metabolic rate of the mass of activated sludge in the tank; continuously determining the rate of substrate consumption in the tank based on said CO_2 volume determination; continuously determining the rate at which a given weight of sewage enters the tank based on said substrate consumption rate, said rate to be termed food, selecting the food to mass ratio which provides the optimum activated sludge settling rate at the final clarifier, continuously determining an optimum set density of the mass of activated sludge in the tank based upon the aforesaid determination of the food entering the tank, the substrate consumption rate and the aforesaid selected food to mass ratio; continuously comparing the measured activated sludge density with the optimum set activated sludge density to determine the difference between the set and the measured densities, and regulating the amount of the portion of activated sludge that is returned to the tank in response to the aforesaid density difference to thereby bring the said density difference to zerio.

4,130,482

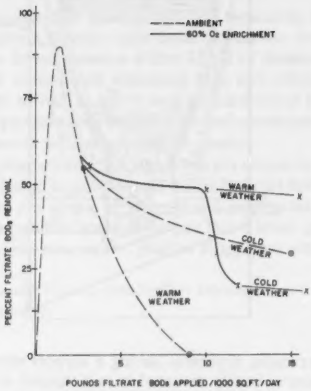
WASTEWATER TREATMENT

Wilbur N. Torpey, New York, N.Y., assignor to Autotrol Corporation, Milwaukee, Wis.

Continuation of Ser. No. 749,542, Dec. 10, 1976, abandoned, which is a continuation of Ser. No. 602,578, Aug. 7, 1975, abandoned. This application Jun. 30, 1977, Ser. No. 811,510

Int. Cl.[2] C02C *1/04*

U.S. Cl. 210—17 **2 Claims**



1. A method of treating wastewater containing filtrate BOD_5 and at a wastewater temperature of less than 60° F., comprising the steps of:

(a) supplying said wastewater to a first stage biological treatment unit at a first loading rate,

(b) supplying the effluent wastewater from said first stage biological treatment unit to a second stage biological treatment unit at a second loading rate,

(c) said first and second stages employing rotatable biological contactors having surface area for the growth and maintenance of biological slimes,

(d) said second stage including at least about 30% to not more than about 70% of the contactor surface area of said first stage,

(e) rotating said biological contactors of said first and second stages at a predetermined rotational rate of between 0.6 and 2.0 RPM to alternately expose said surface area to a gaseous atmosphere and to grow and maintain biological slimes on said surface area,

(f) said gaseous atmosphere comprising from about 30% to about 80% oxygen by volume,

(g) said first and second loading rates, expressed as pounds of filtrate BOD_5 per day per 1,000 square feet of contactor surface, being from about 6 to about 10.

4,130,483

SEWAGE TREATING AND CONVERSION PROCESS

Owen R. Waltrip, Roseville, Calif., assignor to Nuclear Supreme, Casper, Wyo.

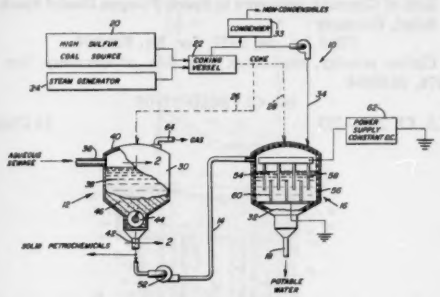
Filed Oct. 14, 1977, Ser. No. 842,370

Int. Cl.[2] B01D *15/00*

U.S. Cl. 210—40 **3 Claims**

1. A process for decontaminating sewage by use of coal having a high sulfur content, including the steps of: coking the coal to form a particulate product and a gaseous product; charging first and second filter zones with said particulate product to form filter beds therein; passing the sewage through the first of the filter zones to extract a liquid effluent and form a settled solid product; electrically charging the filter bed in

the second of the settling zones; condensing the gaseous product to form a condensate; and conducting said condensate and



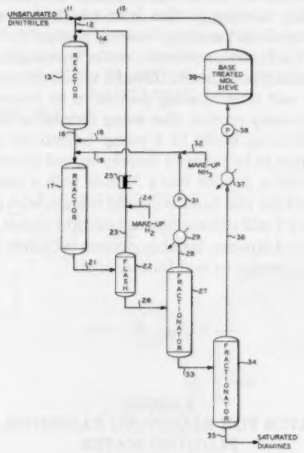
the liquid effluent to said second of the settling zones for passage through the electrically charged filter bed to extract a decontaminated liquid product therefrom.

4,130,484

PURIFICATION PROCESS

Stanley J. Marwil, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 28, 1976, Ser. No. 700,422
Int. Cl.² B01D *15/00*
U.S. Cl. 210—41 **18 Claims**



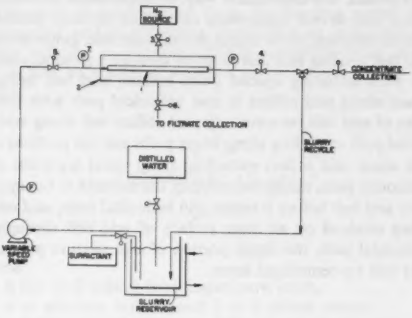
1. In a process for removing at least a substantial portion of at least one contaminant from a fluid containing said at least one contaminant and at least one dehydration sensitive compound, said at least one contaminant being selected from the group consisting of water and nitrogen compounds having the formula XNH_2 wherein X is selected from the group consisting of hydrogen and linear alkyl radicals having 1 to 22 carbon atoms wherein said fluid is contacted with a molecular sieve having an effective pore diameter in the range of about 2 to about 6 Angstrom units, thereby causing substantial dehydration of said dehydration sensitive compound; the improvement comprising treating said molecular sieve with at least one base selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, alkaline earth hydroxides and alkaline earth carbonates and utilizing the thus treated molecular sieve to contact said fluid to thereby at least substantially reduce the dehydration of said dehydration sensitive compound.

4,130,485

NOVEL FILTRATION PROCESS AND APPARATUS

Gerald T. Dyer, Weston, and Michael A. Ryan, Framingham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 613,618, Sep. 15, 1975, abandoned, which is a continuation-in-part of Ser. No. 418,058, Nov. 21, 1973, abandoned. This application May 10, 1977, Ser. No. 795,653
Int. Cl.² B01D *29/00*
U.S. Cl. 210—66 **24 Claims**



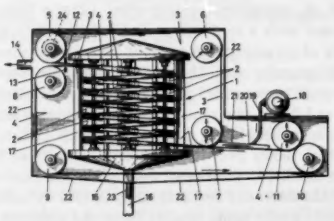
1. A process for filtering solid/fluid dispersions wherein said dispersion comprises solids having a particle size distribution between about 0.1μ to about 50μ and which comprises the step of circulating said dispersion through apparatus having filtration means comprising at least one tubular member having a rigid, porous wall providing pores having a micron rating between about 0.5 to about 5 microns and maintaining said dispersion at a flux rate sufficient to prevent any substantial number of particles having a particle size less than said micron rating from passing through said pores whereby filtration of said dispersion is achieved by removing fluid through said pores while increasing the concentration of solids in said dispersion as said dispersion is circulated through said hollow member.

4,130,486

METHOD AND DEVICE FOR THE SEPARATION OF A LIQUID-CONTAINING MIXTURE

Uilke van Essen, Gorinchem, Netherlands, assignor to Pollutex Milieutechniek B.V., Rijswiji, Netherlands

Filed Feb. 23, 1976, Ser. No. 660,186
Int. Cl.² B01D *33/02*
U.S. Cl. 210—78 **12 Claims**



1. A method for the separation of a liquid-containing mixture into two phases using a first endless liquid permeable flexible belt disposed about spaced guide rollers, said method comprising the steps of guiding said belt about the spaced guide rollers along a generally helicoidal path with the portions of said belt between adjacent rollers and in said generally helicoidal path

extending along linear paths and the portions of the belt about the rollers extending along spiral segments of the helicoidal path, depositing said material on said endless liquid-permeating first flexible belt while said first belt is moving in a linear path, thereafter moving said belt in said generally helicoidal path with said material on an interior surface of said belt and at a speed sufficient to cause the liquid portion of said mixture to pass through said belt by centrifugal force, and removing the solid part of said mixture from said belt at the end of said helicoidal path.

9. A device for separation of a liquid-containing mixture into two phases, in a mechanical way, by application of centrifugal force, said device comprising an endless moisture permeable, first flexible belt, drive means driving said belt, guide means for said belt causing said belt to move through a generally helicoidal path including spaced guide rollers, said belt being disposed about said rollers in said helicoidal path with the portions of said belt between adjacent rollers and along said helicoidal path extending along linear paths and the portions of the belt about said rollers extending along spiral segments of the helicoidal path, means introducing the mixture to be separated onto said belt before it enters said helicoidal path, said mixture being retained on an inner surface of said belt through said helicoidal path, the liquid portion of said mixture permeating said belt by centrifugal force.

4,130,487

FILTERS FOR LIQUIDS OR GASES

George S. Hunter; Susanne P. Hunter, both of Houghton-le-Spring, and Brian Walker, Washington, all of England, assignors to Process Scientific Innovations Ltd., Durham, England

Filed Apr. 4, 1977, Ser. No. 784,320

Claims priority, application United Kingdom, Apr. 5, 1976, 13640/76; Nov. 11, 1976, 46969/76; Mar. 8, 1977, 9680/77; May 10, 1976, 19083/76

Int. Cl.[2] B01D *53/02, 46/02*

U.S. Cl. 210—85 **9 Claims**

1. A filter element for fluids comprising at least one cylindrical sheet of nonwoven microporous fibrous filter material impregnated with a synthetic resin binder, said filter material consisting of an amorphous mass of borosilicate glass fibers, a substantial quantity of said borosilicate glass fibers each having a diameter of between 0.5 to 9.0 microns and a length of between 1 and 2 mm, the remaining fibers having a length of up to 6 mm, said sheet being at least about 0.03 inches thick and formed with pleats over its entire area, said pleats being substantially parallel to the axis of said cylindrical sheet and presenting peaks internally and externally of said cylindrical sheet, the internal peaks being spaced from the external peaks by approximately 0.6 cm, and at least one perforate supporting cylinder of comparatively rigid material formed with perforations substantially over its whole area, said supporting cylinder being mounted closely adjacent to said cylindrical sheet to provide support for said sheet, said synthetic resin binder providing support for said borosilicate microporous fibrous material between said peaks.

4,130,488

DEVICE FOR CLEANING AND CIRCULATING A LIQUID

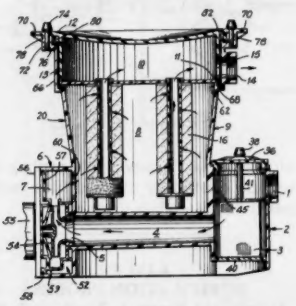
Walter Speck, Hilpoltstein, and Willy Speck, Behringers-dorf, both of Germany, assignors to Speck-Pumpen Daniel Speck & Sohni, Germany

Filed Jun. 24, 1977, Ser. No. 809,804

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639854

Int. Cl.[2] B01D *27/08*

U.S. Cl. 210—232 **16 Claims**



1. In a device for circulating and cleaning a liquid, a one-piece plastic body which substantially in its entirety is in the form of a unitary wall structure incapable of being disassembled into subsidiary components, said body having a strainer housing portion for receiving raw liquid which is to be cleaned, a filter housing portion from which cleaned liquid is to be discharged, and a pump housing portion for housing a pump and formed with a pressure outlet communicating with said filter housing portion and through which pumped liquid is delivered to said filter housing portion to be filtered therein, said pump housing portion also being formed with a suction inlet for delivering liquid to a pump housed by said pump housing portion to be pumped thereby to said pressure outlet, said filter housing portion being formed with a passage communicating on the one hand with said suction inlet and on the other hand with said strainer housing portion so that raw liquid received in said strainer housing portion will flow therefrom through said passage to said suction inlet.

4,130,489

APPARATUS FOR REMOVING RAINBOWS FROM FLOWING WATER

Gerall A. Black, 7532 Oakland Ave. South, Minneapolis, Minn. 55423

Continuation-in-part of Ser. No. 566,386, Apr. 9, 1975, abandoned. This application Sep. 26, 1977, Ser. No. 836,601

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—242 AS **2 Claims**

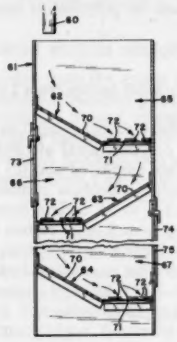
1. Apparatus for removing oil from moving water, comprising, in combination:

first and second purifier stages comprising chambers containing free floating pads of buoyant material preferentially absorptive of oil in the presence of water, each said chamber having a bottom comprising a downwardly and inwardly sloping solid baffle portion and an abutting horizontal perforated portion supporting the buoyant material;

means admitting liquid to be treated to fall on said baffle portion of said first stage;

and means mounting the second chamber below and verti-

cally spaced from first chamber so that liquid flowing from the perforated bottom portion of the bottom of said



first chamber impinges upon the baffle portion of said second chamber.

4,130,490

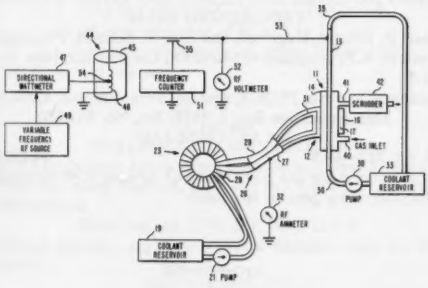
ELECTRIC DISCHARGE FOR TREATMENT OF TRACE CONTAMINANTS

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Daniel L. Flamm, Chatham Township, Morris County, N.J., and Theodore J. Wydeven, Jr., Sunnyvale, Calif.

Filed May 23, 1977, Ser. No. 799,832

Int. Cl.[2] B01K *1/00*

U.S. Cl. 250—531 **11 Claims**



1. A radio-frequency glow discharge reactor for the chemical processing of an oxygen-bearing gas containing trace contaminants comprising:

a first electrode facing a dielectric wall backed by a second electrode;

first cooling means for cooling said first electrode;

second cooling means for cooling said dielectric wall and said second electrode;

means for channeling the oxygen-bearing gas containing trace contaminants between said first electrode and said dielectric wall; and

a supply of high-voltage radio-frequency energy generated by a helical resonator, said supply being connected between said first and second electrodes to subject the oxygen bearing gas to a radio frequency glow discharge whereby the trace contaminants in the oxygen-bearing gas are oxidized into a few simple products.

4,130,491

USE OF BETAINES IN MINERAL OIL RECOVERY

Helmut Wagner, Bachstrasse 2, 6834 Ketsch, and Hans-Joachim Neumann, Neukollnerweg 4, 3340 Wolfenbuttel, both of Germany

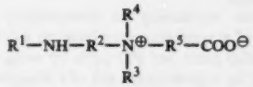
Filed Jul. 16, 1976, Ser. No. 705,766

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1975, 2532469

Int. Cl.[2] E21B *43/22*

U.S. Cl. 252—8.55 D **1 Claim**

1. In a method for recovering mineral oil from deposits thereof wherein the deposit is flooded with an aqueous solution and the oil is then recovered from the flooding water, the improvement which comprises employing as said aqueous flooding solution an aqueous solution containing from about 0.001 to 10% by weight of a surface active betaine having the formula:



wherein

R^1 is the acyl radical from naphthenic acids,

R^2 is an alkylene residue with 2 to 6 carbon atoms,

R^3 and R^4 may be the same or different and are low molecular weight alkyl residues, and

R^5 is an alkylene residue with 1 to 3 carbon atoms.

4,130,492

MXY_3 SOLID LUBRICANTS

John M. Longo, New Providence, and John J. Steger, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 870,033 Jan. 16, 1978, abandoned which is a continuation of Ser. No. 788,686, Apr. 18, 1977, abandoned.

This application Mar. 30, 1978, Ser. No. 891,749

Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*

U.S. Cl. 252—18 **37 Claims**

29. A lubricant comprising a major amount of lubricating oil and about 0.1 to 20 wt. % of material of the formula MXY_3 wherein M is selected from the group consisting of Mg, V, Mn, Fe, Co, Ni, Zn, Cd, Sn, Pb and mixtures thereof, X is a pnictide selected from the group consisting of phosphorus, arsenic, antimony and mixtures thereof and Y is a chalcogenide selected from the group consisting of sulfur, selenium and mixtures thereof.

4,130,493

MACHINING FLUID

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jul. 19, 1977, Ser. No. 816,966

Claims priority, application Japan, Jul. 20, 1976, 51-86330; Sep. 17, 1976, 51-112301; Dec. 21, 1976, 51-153892; Jan. 18, 1977, 52-3512

Int. Cl.[2] C10M *1/10, 3/02, 5/02;* **C05B** *11/16*

U.S. Cl. 252—28 **12 Claims**

1. A method of machining a metallic workpiece, comprising the steps of: cultivating a microorganism in an aqueous cultivation bath containing a saccharide, an inorganic salt and a nitrogen source to produce an organic compound of the spiculisporic acid structure, introducing 50 to 20,000 ppm of said organic compound into an aqueous machining liquid to form a corrosion resistant fluid, and displacing a tool and said workpiece relative to machine said workpiece in the presence of said fluid.

2. A machining fluid comprising an aqueous basic flushing component adapted to facilitate a workpiece-machining opera-

tion and an anti-rusting component including an organic compound which is produced by a fermentation process comprising cultivating a microorganism in a culture medium containing a saccharide, a nitrogen source and an inorganic salt and accumulated in a culture broth and separated and recovered from the culture broth and comprising an aliphatic acid or anhydrous derivative thereof having at least ten carbon atoms, three carboxy radicals and one hydroxyl radical.

4,130,494

SYNTHETIC LUBRICANT COMPOSITION

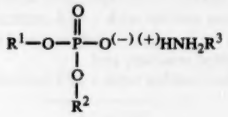
Harold Shaub, New Providence, and Stephen J. Metro, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 683,266, May 5, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,633

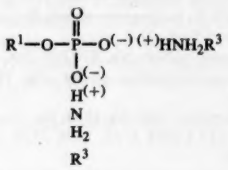
Int. Cl.[2] C10M *1/44, 3/38, 5/24, 7/24*

U.S. Cl. 252—32.5 **22 Claims**

1. A synthetic lubricating oil composition comprising a major amount of a synthetic ester base oil stock, from about 0.01 to about 10.0 parts per 100 parts by weight of the ester base oil stock of an organo amine salt of a phosphoric acid ester selected from the group consisting of organo amine salts characterized by the formula:

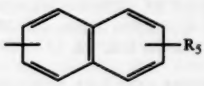


or the formula:



and mixtures thereof, wherein R^1 is an alkyl or alkenyl group containing from 1 to 10 carbon atoms, R^2 is either the same or a different alkyl or alkenyl group containing from 1 to 10 carbon atoms and R^3 is either hydrogen, an alkyl or alkenyl group containing from 1 to 22 carbon atoms or an arylalkyl group characterized by the formula:

or the formula:



wherein R_4 is hydrogen, or an alkyl or alkenyl group containing from 1 to 12 carbon atoms and R_5 is hydrogen or an alkyl or alkenyl group containing from 1 to 6 carbon atoms; and from about 0.01 to about 5.0 parts per 100 parts by weight of the ester base oil stock of an organo sulfonic acid ammonium salt, said synthetic ester base oil stock selected from the group consisting of (a) simple esters derived from monohydric aliphatic alcohols having 1 to 18 carbon atoms and monobasic aliphatic acids having 2 to 22 carbon atoms or dibasic aliphatic acids having 2 to 25 carbon atoms, (b) complex esters formed from the reaction of two or more of the following compounds:

(i) monohydric aliphatic alcohols having 1 to 18 carbon atoms,

(ii) monobasic aliphatic acids having 2 to 22 carbon atoms,

(iii) aliphatic glycols or polyglycols having from 2 to 70 carbon atoms,

(iv) polyhydric aliphatic alcohols having 4 to 25 carbon atoms,

(v) dibasic aliphatic acids having from 2 to 22 carbon atoms, and

(iv) polybasic aliphatic acids having 3 to 30 carbon atoms,

where at least one polyfunctional alcohol and at least one polyfunctional acid are employed and (c) polyesters derived from polyhydric aliphatic alcohols containing from 2 to 10 hydroxyl groups and 4 to 25 carbon atoms and monobasic aliphatic acids having from 2 to 22 carbon atoms.

15. The synthetic lubricating oil composition of claim **1**, further comprising at least one antioxidant selected from the group consisting of di(alkylphenyl) amines, phenyl-α-naphthylamine, phenyl-β-naphthylamine and alkylphenyl-α-naphthylamine and alkylphenyl-β naphthylamine, and mixtures thereof.

4,130,495

LIQUID JOJOBA OIL DERIVATIVES

Jaime Wisniak, and Hanoch Benajahu, both of Beer Sheva, Israel, assignors to Ben-Gurion University of the Negev Research and Development Authority, Beer Sheva, Israel

Filed Nov. 18, 1976, Ser. No. 743,012

Claims priority, application Israel, Dec. 2, 1975, 48585

Int. Cl.[2] C08G *75/00;* **C10M** *1/38*

U.S. Cl. 252—48.4 **12 Claims**

1. A non-factice sulfohalogenated jojoba oil characterized by a M.W. under 4,500, and an iodine value greater than 5, a sulfur content below 8.7% by weight and having a sulfur to halogen mole ratio of about 1.1:1.0 to about 1.0:1.1.

4,130,496

PROCESS OF PREPARING MONOARYL PHOSPHONATES AND LUBRICANT COMPOSITIONS CONTAINING SAME

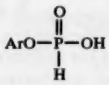
Robert F. Bridger, Hopewell, and Kirk D. Schmitt, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 717,815, Aug. 26, 1976, Pat. No. 4,092,254. This application Jan. 9, 1978, Ser. No. 867,850

Int. Cl.[2] C10M *1/10*

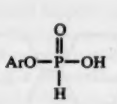
U.S. Cl. 252—49.8 **14 Claims**

1. A process for the preparation of monoaryl phosphonates of the following general structure:



wherein Ar is selected from the group consisting of phenyl, alkyl phenyl, halophenyl, haloalkyl phenyl, ketoalkyl phenyl, alkoxy phenyl, carbalkoxy phenyl, naphthyl, alkyl naphthyl, halonaphthyl, haloalkyl naphthyl, ketoalkyl naphthyl, alkoxy naphthyl, and carbalkoxy naphthyl, said alkyl and alkoxy substituents thereof having from 1 to about 30 carbon atoms, comprising heating the corresponding aryl di - t - C_4–C_{30} alkyl phosphite at a temperature of from about 60°–150° C. in the presence of a heterogeneous acid cation exchange resin catalyst and recovering the desired monoaryl phosphonate.

10. A method for reducing wear between moving metal surfaces which comprises introducing between said surfaces a lubricant composition comprising a major amount of an oil of lubricating viscosity or a grease prepared therefrom and a minor amount sufficient to improve the antiwear properties of said composition of a monoaryl phosphonate of the following general structure:



wherein Ar is selected from the group consisting of phenyl, alkyl phenyl, halophenyl, haloalkyl phenyl, ketoalkyl phenyl, alkoxyphenyl, carbalkoxy phenyl, naphthyl, alkyl naphthyl, halonaphthyl, haloalkyl naphthyl, ketoalkyl naphthyl, alkoxy naphthyl, and carbalkoxy naphthyl said alkyl and alkoxy substituents thereof having from 1 to about 30 carbon atoms.

4,130,497
DETERGENT COMPOSITION

Francis E. J. Oneto, Clichy-sous-Bois; Andre' J. E. Benzoni, Livry-Gargan; Jacques L. Poret, Mitry-Mory, and Fernand B. Simon, Margency, all of France, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 12, 1977, Ser. No. 758,819

Claims priority, application United Kingdom, Jan. 16, 1976, 1793/76

Int. Cl.[2] C11D *1/10*

U.S. Cl. 252—89 R **8 Claims**

1. A single liquid phase detergent composition comprising:
(i) from 15 to 50% by weight of a cosmetically acceptable oil;
(ii) from 40 to 75% by weight of an anionic detergent mixture comprising
(a) an anhydrous amine salt of a C_8 to C_{18} fatty alcohol sulphate containing an average of from 0 to 4 moles of ethylene oxide; and
(b) an anhydrous alkyl or alkylaryl substituted ethoxylated oxacarboxylic acid or a sodium or an amine salt thereof having the empirical formula:

$$R—(OCH_2CH_2)_n—OCH_2COOX$$

where
R is C_8 to C_{18} alkyl or C_6 to C_{12} alkylphenyl;
n has an average value of from 1 to 15; and
X is hydrogen, sodium or an amine residue; and
(iii) from 0 to 5% water.

4,130,498
DETERGENT COMPOSITIONS

Frank Lee, Bolton; James Allan, Cheadle, and Charles Fearnley, Romiley, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Sep. 14, 1976, Ser. No. 723,118

Claims priority, application United Kingdom, Sep. 17, 1975, 38146/75

Int. Cl.[2] C11D *7/56*

U.S. Cl. 252—99 **9 Claims**

1. A detergent composition consisting essentially of
(a) 0 to 50% by weight of a non-ionic synthetic surfactant selected from the group consisting of
(1) monoethers of polyglycols with long-chain fatty alcohols,
(2) monoesters of polyglycols with long-chain fatty acids,
(3) monoethers of polyglycols with alkylphenols,
(4) N,N-polyethoxylated long-chain fatty amines,
(5) N,N-polyethoxylated long-chain fatty acid amides, and
(6) mixtures thereof,
(b) 50 to 80% by weight of water-soluble builder and extender
(c) 0 to 25% by weight of a water-soluble anionic surfactant and
(d) 0.01 to 2.5% by weight of a highly-dispersed, solid, water-insoluble urea-formaldehyde condensation product having a molecular weight greater than 1000 and a specific surface area of 15 to 30 m^2/g, said condensation product being one which is produced in the presence of sulphamic acid
each of the percentages being based on total finished detergent, with the proviso that at least 5% by weigh of either a non-ionic or an anionic surfactant is present in the detergent composition.

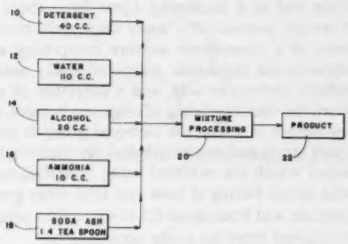
4,130,499
CORK CLEANING FORMULA

Vernon T. Cameron, 1500 Marquette Ave., South Milwaukee, Wis. 53172

Filed Aug. 15, 1977, Ser. No. 824,491

Int. Cl.[2] C11D *3/02, 3/10, 3/43, 17/08*

U.S. Cl. 252—153 **3 Claims**



1. A cleaning formula comprising
a detergent in a quantity of 40 cc;
water in a quantity of 110 cc;
rubbing alcohol in a quantity of 20 cc;
ammonia in a quantity of 10 cc; and
sodium carbonate in a quantity of one-fourth teaspoon.

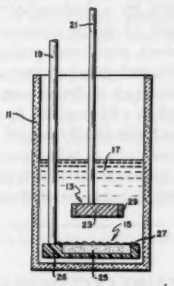
4,130,500
LITHIUM-ALUMINUM-MAGNESIUM ELECTRODE COMPOSITION

Carlos A. Melendres, Bolingbrook, and Stanley Siegel, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 14, 1977, Ser. No. 860,655

Int. Cl.[2] H01M *4/40, 4/46*

U.S. Cl. 252—182.1 **8 Claims**



1. A solid electrode composition for use in the negative electrode of a high-temperature, secondary electrochemical cell having molten salt electrolyte including alkali metal halides or alkaline earth metal halides and in a positive electrode including a chalcogen or a transition metal chalcogenide, said solid electrode composition comprising about 5 to 50 atom percent lithium and about 95 to 50 atom percent alloy of alumi-

num and magnesium, said aluminum-magnesium alloy comprising about 5 to 20 atom percent magnesium.

4,130,501

STABLE VISCOUS HYDROGEN PEROXIDE SOLUTIONS CONTAINING A SURFACTANT AND A METHOD OF PREPARING THE SAME

Charles W. Lutz, Princeton, and Leon E. Cohen, Somerset, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Sep. 20, 1976, Ser. No. 724,780
Int. Cl.[2] C01B *15/02*
U.S. Cl. 252—186 **14 Claims**

1. A stable viscous aqueous solution of hydrogen peroxide having a viscosity within the range of about 60 cps-6000 cps consisting essentially of from about 3% to about 30% hydrogen peroxide and as a thickening agent from about 0.05 to about 0.5 weight percent of a water dispersible cross-linked interpolymer of a monomeric mixture comprising a monomeric polymerizable alpha-beta monoolefinically unsaturated lower aliphatic carboxylic acid, and a polyether of a polyol selected from the class consisting of oligo saccharides, reduced derivatives thereof in which the carbonyl group is converted to an alcohol group and pentaerythritol, the hydroxyl groups of said polyol which are modified being etherified with allyl groups, said polyol having at least two allyl ether groups per polyol molecule, and from about 0.5 to 4.0 weight percent of a surfactant selected from the group consisting of:

(1) alkali metal alkyl sulfates;
(2) linear alkylaryl alkali metal sulfonates;
(3) straight chain primary aliphatic ethoxylated alcohols having a melting point above room temperature; and
(4) block copolymer polyols;
(a) characterized by a hydrophilic lipophilic balance value of about 30.5 and a molecular weight of about 4,750; said block copolymer polyol being obtained by adding poly(oxyethylene) groups to a poly(oxypropylene) chain having a molecular weight of about 950;
(b) characterized by a hydrophilic lipophilic balance value of about 24 and a molecular weight of about 7,500; said block copolymer polyol being obtained by adding poly-(oxyethylene) groups to a poly(oxypropylene) chain having a molecular weight of about 2,250;
(c) characterized by a hydrophilic lipophilic balance value of about 13.5 and a molecular weight of about 4,585; said block copolymer polyol being obtained by adding poly(oxy-ethylene) groups to a poly(oxypropylene) chain having a molecular weight of about 2,750;
(d) characterized by a hydropholic lipophilic balance value of about 15 and a molecular weight of about 6,500; said block copolymer polyol being obtained by adding poly(oxyethylene) groups to a poly(oxypropylene) chain having a molecular weight of about 3,250;
(e) characterized by a hydrophilic lipophilic balance value of about 22 and a molecular weight of about 13,333; said block copolymer polyol being obtained by adding poly-(oxyethylene) groups to a poly(oxypropylene) chain having a molecular weight of about 4,000.

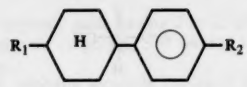
4,130,502

LIQUID CRYSTALLINE CYCLOHEXANE DERIVATIVES

Rudolf Eidenschink; Joachim Krause, and Ludwig Pohl, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit, Darmstadt, Germany

Filed Aug. 10, 1977, Ser. No. 823,308
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636684
Int. Cl.[2] C09K *3/34*; G02F *1/13*
U.S. Cl. 252—299 **12 Claims**

1. Compounds of the formula:



wherein R_2 is cyano and R_1 is R, OR, OCOR or OCOOR, in which R is alkyl of up to 12 carbon atoms.

12. A mixed liquid crystalline dielectric composition containing at least 40% of a compound of claim 1.

4,130,503

PHOSPHITE IN MGX_2 SUPPORTED $TiX_3/AlCl_3$ CATALYST SYSTEM

Lawrence M. Fodor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 23, 1977, Ser. No. 864,120
Int. Cl.[2] C08F *4/02, 4/16*
U.S. Cl. 252—429 B **12 Claims**

1. A catalyst which forms on mixing $MgCl_2$, $TiCl_3$, $AlCl_3$ and an organic phosphite to form a first component which first component is combined with a cocatalyst comprising an organoaluminum compound, said $MgCl_2$ being present in an amount within the range of 50 to 95 weight percent, said Ti Cl_3 being present in an amount within the range of 2 to 20 weight percent, said Al Cl_3 being present in an amount of 0.1 to 10 weight percent and said organic phosphite being present in an amount of 1 to 20 weight percent, based on the total weight of said first component.

4,130,504

OXIDATIVE COUPLING OF PHENOLS AND NAPHTHOLS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 655,104, Feb. 4, 1976, Pat. No. 4,070,383, which is a continuation-in-part of Ser. No. 550,445, Feb. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 499,826, Aug. 23, 1974, abandoned. This application Oct. 31, 1977, Ser. No. 846,811
Int. Cl.[2] B01J *31/02, 31/04*
U.S. Cl. 252—430 **4 Claims**

1. A catalyst composition consisting essentially of
(a) a copper compound selected from the group consisting of cupric halides, basic cupric halohydroxides, cupric carboxylates, cupric nitrate, cupric sulfate, cupric alkylsulfates, cupric aryl sulfonates, cupric carbonate, basic cupric carbonate, cupric hydroxide, cupric chlorate, cuprous halides, and cuprous red oxide,
(b) an anionic surfactant in which the hydrophilic moiety is selected from the group consisting of carboxylate, phosphate, sulfate and sulfonate, and
(c) an alkaline material selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, and alkali metal bicarbonates.

4,130,505

TWO STAGE ACTIVATION OF FLUORIDED CHROMIUM-CONTAINING CATALYST

Benny E. Nasser, Jr., and Richard E. Dietz, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 26, 1974, Ser. No. 509,640
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 17, 1976
Int. Cl.[2] B01J *21/02, 27/06, 29/00*
U.S. Cl. 252—432 **12 Claims**

1. A process for producing a catalyst comprising:
calcining a chromium-containing silicon-containing support;

cooling said thus calcined support and incorporating therewith an anhydrous fluorine-containing compound; and

thereafter heating said support containing said fluorine-containing compound at a temperature within the range of 300° to 1000°F, which temperature is lower than the temperature used for said calcining.

4,130,506

METAL POWDERS

Owen N. Collier, and Stephen J. Hackett, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Jul. 6, 1976, Ser. No. 702,727

Claims priority, application United Kingdom, Jul. 4, 1975, 28264/75

Int. Cl.² B01J *21/04, 21/08, 23/40, 23/48*

U.S. Cl. 252—438 **5 Claims**

1. A method of making a metal powder comprising (i) activating particles of a heat resistant substrate which is a refractory material selected from the group consisting of clay, silica, alumina, titania, zirconia, silicon nitride, silicon carbide and mixtures thereof by boiling the particles in water or dilute mineral acid whereby the maximum surface area thereof becomes available for the nucleation and growth of metal or alloy thereon, then (ii) mixing said activated substrate particles with an aqueous or organic solution of a reducible compound of platinum, palladium, rhodium, ruthenium, iridium, osmium, gold or silver and reducing said compound by a reducing agent to the metal whereby the metal is nucleated onto the surface of individual substrate particles and, thereafter, (iii) growing further metal onto the resulting nucleated particles by further reduction.

4,130,507

NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 642,648, Dec. 19, 1975, Pat. No. 4,072,602, which is a continuation-in-part of Ser. No. 442,714, Feb. 14, 1974, Pat. No. 3,928,177, which is a continuation-in-part of Ser. No. 216,739, Jan. 10, 1972, Pat. No. 3,806,446, which is a division of Ser. No. 17,886, Mar. 9, 1970, abandoned. This application Sep. 6, 1977, Ser. No. 830,943

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.² B01J *27/04, 23/64*

U.S. Cl. 252—439 **17 Claims**

1. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % Group IV-A metal, about 0.01 to about 3 wt. % Group VI-B transition metal and about 0.1 to about 5 wt. % alkali metal or alkaline earth metal; wherein the platinum group metal, Group IV-A metal, Group VI-B transition metal, and alkali metal or alkaline earth metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the Group IV-A, Group VI-B transition metal, and alkali metal or alkaline earth metal are present in an oxidation state above that of the elemental metal; and wherein the atomic ratio of Group VI-B transition metal to platinum group metal is about 0.05:1 to about 4:1.

4,130,508

PERFUME COMPOSITIONS CONTAINING CYCLOHEXADIENE DERIVATIVES

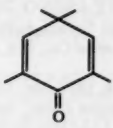
Kenneth K. Light, Long Branch; Bette M. Spencer, Ocean Grove; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y.; Manfred H. Vock, Locust, N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 774,058, Mar. 3, 1977, Pat. No. 4,076,854. This application Dec. 13, 1977, Ser. No. 860,123

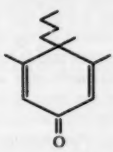
Int. Cl.² C11B *9/00*

U.S. Cl. 252—522 **2 Claims**

1. A perfume composition comprising a cyclohexadiene derivative selected from the group consisting of 2,4,4,6-tetramethylcyclohexa-2,5-diene-1-one having the structure:



and 4-butyl-3,4,5-trimethyl-2,5-cyclohexadiene-1-one having the structure:



and one or more auxiliary perfume ingredients compatible with said cyclohexadiene derivative selected from the group consisting of alcohols, aldehydes, nitriles, esters, cyclic esters and natural essential oils.

4,130,509

PERFUME COMPOSITIONS CONTAINING CIS- AND TRANS-TRIMETHYLCYCLOHEXYLETHYL ETHERS

Jens Conrad, Hilden; Klaus Bruns, Krefeld-Traar, and Peter Meins, Mettmann, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Germany

Filed Dec. 21, 1977, Ser. No. 862,675

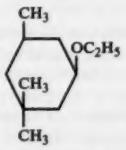
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658567

Int. Cl.² C11B *9/00*

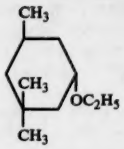
U.S. Cl. 252—522 **4 Claims**

1. A perfumery composition comprising from about 1% to 50% by weight of a perfume selected from the group consisting of

(1) cis-3,3,5-trimethylcyclohexylethyl ether of the formula



(2) trans-3,3,5-trimethylcyclohexylethyl ether of the formula



, and

(3) mixtures thereof, and the remainder customary constituents of perfumery compositions.

4,130,510

CURING OF EPOXY RESIN SYSTEMS USING HALFESTER COMPOUNDS CONTAINING ALIPHATIC TERTIARY AMINO GROUPS

Goro Tanaka, and Hiroshi Suzuki, both of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd. and Hitachi, Ltd., both of, Japan

Filed Apr. 14, 1977, Ser. No. 787,488
Claims priority, application Japan, Apr. 14, 1976, 51/41363
Int. Cl.² C08L *63/00*
U.S. Cl. 260—823 **34 Claims**

1. In the curing of epoxy resin systems which are normally catalyzed by tertiary amines, the improvement that comprises employing a latent curing catalyst comprising a half-ester compound which contains at least one ester group terminated by an aliphatic tertiary amino group and which contains at least one carboxyl group, with said at least one carboxyl group forming at least one intramolecular salt with said tertiary amino group, said at least one ester group and said at leat one carboxyl group being directly connected to an aliphatic or aromatic polyvalent group, the amount of said half-ester compound being about 0.05 to 15% by weight based on the epoxy resin.

4,130,511

CURABLE EPOXIDE RESIN COMPOSITIONS

Christopher M. Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 5, 1977, Ser. No. 794,278
Claims priority, application United Kingdom, May 19, 1976, 20630/76
Int. Cl.² C08G *59/68*
U.S. Cl. 528—92 **10 Claims**

1. Composition comprising
(a) an aromatic compound having more than one amino group directly attached to an aromatic ring and
(b) a nitrate of magnesium, lanthanum, manganese, zinc, or cobalt.

4,130,512

ION EXCHANGE MATERIALS

Michael Streat, Wembley, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 420,439, Nov. 30, 1973, abandoned. This application Feb. 19, 1976, Ser. No. 659,496
Claims priority, application United Kingdom, Jan. 10, 1973, 12777/73
Int. Cl.² C08J *5/20*
U.S. Cl. 521—31 **13 Claims**

1. A process for the production of a particulate ion exchange material of increased resistance to acid and alkali attack which comprises heating a particulate inorganic material selected from the group consisting of inorganic oxide gels and inorganic silicates, to a temperature of from 100° to 550° C. to produce a porous inert inorganic substrate, adsorbing an ethylenically unsaturated organic monomer into the substrate and polymerising the adsorbed monomer so that the resultant polymer is retained within the pores of the substrate, and, if necessary, introducing ion exchange functional groups into the polymer.

4,130,513

FLAME RETARDED POLYURETHANE FOAMS WITH IMPROVED COLOR QUALITIES

Michael J. Reale, Brewster, N.Y., and Barry Jacobs, Bethel, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 22, 1977, Ser. No. 808,753
Int. Cl.² C08K *5/18, 5/34, 5/51*
U.S. Cl. 521—107 **10 Claims**

1. A flame retardant polyurethane foam comprising a low density polyurethane foam, a flame retardant amount of a flame retardant comprised of a poly(haloethyl-ethyleneoxy) phosphoric acid ester and from about 0.5 percent to about 5.0 percent by weight of said flame retardant of a mixture of diphenyl p-phenylene diamine and the reaction product of diphenylamine and acetone wherein the components of said mixture are in a weight ratio from about 1:20 to about 20:1.

4,130,514

SYNTHESIS OF PEPTIDES

Takashi Enkoji, Park Forest, and Martin O. Skibbe, Kankakee, both of Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Feb. 10, 1978, Ser. No. 876,752
Int. Cl.² C08L *37/00;* C07C *103/52;* A61K *37/00*
U.S. Cl. 260—8 **19 Claims**

1. A peptide having the structure

X—tyr—ser—met—glu—his—phe—arg—trp—gly—lys—pro—val—gly—lys—lys—arg—arg—Q
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

in which
X is D-ala or β-ala, and
Q is asn, pro-asn, pro-val-asn, pro-val-lys-asn, pro-val-lys-val-asn, pro-val-lys-val-tyr-asn, or pro-val-lys-val-tyr-pro-asn.

4,130,515

LIGNIN-BASED COMPOSITION BOARD BINDER COMPRISING A COPOLYMER OF A LIGNOSULFONATE, MELAMINE AND AN ALDEHYDE

Leopold F. Bornstein, Atlanta, Ga., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Jun. 30, 1977, Ser. No. 811,596
Int. Cl.² C08L *97/00*
U.S. Cl. 260—17.5 **36 Claims**

1. A thermosetting resin composition board binder comprising a copolymer of lignosulfonate, melamine, and an aldehyde, said copolymer prepared by the in situ reaction under alkaline conditions of a lignosulfonate salt, melamine, and an aldehyde.

4,130,516

HIGH DUCTILITY ASPHALT

Duane W. Gagle, and Homer L. Draper, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 12, 1976, Ser. No. 676,259
Int. Cl.² C08L *95/00;* C09D *3/24*
U.S. Cl. 260—28.5 AS **4 Claims**

1. A composition of matter obtained by hot-blending asphalt and about 5 wt. % of sulfur at a temperature below 300° F. further comprising about 1 wt. % of a rubber selected from the group consisting of natural rubber and synthetic rubber.

4,130,517
MULTIPHASE BLOCK AND GRAFT COPOLYMERS COMPRISING A HYDROPHILIC CONTINUOUS PHASE AND HYDROPHOBIC DOMAINS

Robert D. Lundberg, Somerville, and Neville G. Thame, Edison, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 553,613, Feb. 27, 1975, Pat. No. 4,057,598, which is a continuation of Ser. No. 327,831, Jan. 29, 1973, abandoned. This application Mar. 21, 1977, Ser. No. 779,902

The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.

Int. Cl.[2] C08L *53/00*

U.S. Cl. 260—29.2 N **6 Claims**

1. A water swollen gel composition which consists of:

(a) a thermoplastic block copolymer having an average molecular weight of at least 10,000, said block copolymer having the general formula XB—$[AB]_n$—yA wherein n is an integer $\geqq 1$, X and y are 0 or 1, and y is 1 when n is 1, A is a thermoplastic hydrophobic polymer block having a softening point of at least about 35° C. and a molecular weight of at least about 2,000, and B is a thermoplastic hydrophilic polymer block having a molecular weight of at least 6,000 which comprises from about 30–97 wt. % of said copolymer; and

(b) about 30 to about 98 wt. % of water based on the water swollen gel.

4,130,518
PREPARATION OF ACRYLATED OR METHACRYLATED POLYMERS UTILIZING A PARTIALLY SOLUBILIZED HYDROCARBON FRACTION AS THE AZEOTROPING MEDIUM

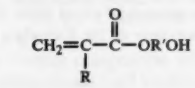
Charles B. Rybny, Franklin Township, Sussex County, and Eli Levine, Union, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 744,491, Nov. 24, 1976. This application Nov. 21, 1977, Ser. No. 853,611

Int. Cl.[2] C08L *91/00;* **C08G** *63/12*

U.S. Cl. 260—22 CB **9 Claims**

1. A process for preparing an ultraviolet curable polymer having pendant acrylate or methacrylate groups which comprises co-reacting in the presence of a vinyl polymerization inhibitor and a nitrogen-oxygen sparge a polymer containing the C-OOH moiety with a monomer having the general formula



wherein R is hydrogen or methyl, and R′ is C_1-C_6 alkyl, utilizing a partially solubilized hydrocarbon fraction as an azeotroping solvent, wherein said solvent contains up to about 15 percent, by weight, aromatics, about 40 to about 80 percent, by weight, saturated aliphatics, and about 20 to about 50 percent, by weight, cyclic aliphatics.

8. The process of claim 1 wherein the polymer is prepared by the alcoholysis of a fatty oil and the further condensation of this product with polyols and polybasic acids.

4,130,519
STABILIZED HALOGENATED BUTYL RUBBER

Robert Roper, Summit; Neil F. Newman, Edison, both of N.J., and Pierre Hous, Steenokkerzeel, Belgium, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 3, 1978, Ser. No. 892,645

Int. Cl.[2] C08K *5/10*

U.S. Cl. 260—23.7 H **21 Claims**

1. A stabilized halogenated butyl rubber composition comprising a copolymer of 85 to 99.5 weight percent of a C_4 to C_8 isoolefin with 15 to 0.5 weight percent of a C_4 to C_{14} multiolefin containing at least about 0.5 weight percent combined halogen in its structure and an effective amount of stabilizer, said stabilizer comprising

(a) an alkali metal carboxylate or an alkaline earth metal carboxylate,

(b) an ether, and

(c) an oxide or hydroxide of a metal selected from Group IIA of the Periodic Table.

4,130,520
AQUEOUS POLYESTER COATING COMPOSITION, METHOD OF MAKING, AND COATED CONDUCTOR

Charles H. Thomas, Monroeville, and Barbara R. Garland, Elizabeth Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 25, 1977, Ser. No. 781,260

Int. Cl.[2] C08G *63/18, 63/20, 63/68*

U.S. Cl. 260—29.2 N **11 Claims**

1. A method of producing a water dispersible polyester resin solution, which comprises esterifying a mixture consisting of:

(a) about 2.0 moles to about 5.0 moles of an organic, dicarboxylic acid selected from the group consisting of aromatic dicarboxylic acids, tetrahydrophthalic acid, and mixtures thereof,

(b) about 0.1 mole to about 1.5 moles of an organic, unsaturated aliphatic dicarboxylic acid,

(c) about 0.1 mole to about 6.5 moles of an organic saturated aliphatic dicarboxylic acid,

(d) about 1.0 mole to about 5.0 mole of an organic, alicyclic dihydric alcohol,

(e) 0 mole to about 5.0 moles of an organic, aliphatic dihydric alcohol, and

(f) about 0.6 mole to about 1.2 moles of an organic compound selected from the group consisting of tris (2 hydroxy alkyl) isocyanurate where alkyl is from 2 to 6 carbons, and polyhydric alcohols containing more than two hydroxyl groups per molecule, and then adding an amount of organic solvent effective to provide a solution of between about 50 wt.% to about 90 wt.% solids content, and finally, diluting the polyester resin solution with a plurality methylated melamine formaldehyde resin, and adding an organic aliphatic amine in an amount effective to provide pH of between about 8 and about 9; wherein the esterification reaction is continued until the acid value drops to between about 45 and about 65, and wherein the mole ratio of OH/COOH = 0.30 to 0.90.

4,130,521
DENSIFICATION OF POLYPYRROLIDONE

Kiyoshi Katsumoto, El Cerrito, and Edward L. Nimer, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 25, 1977, Ser. No. 790,777

Int. Cl.[2] C08G *20/16*

U.S. Cl. 528—326 **14 Claims**

1. A method for reducing the water content and improving the bulk density of finely powdered polypyrrolidone to facilitate the melt extrusion thereof, which comprises compressing powdered polypyrrolidone, having a water content of about from 5–60% by weight, at a temperature of at least about 50° C but below the melting point of polypyrrolidone and a pressure of about from 50 to 300 psi, thereby yielding a solid polypyrrolidone product having a dry bulk density in the range of about from 20–50 pounds per cubic foot.

7. The process of claim 1 wherein said polypyrrolidone powder has a particle size in the range of about from U.S. standard sieve No. 200 to No. 3.

11. A solid polypyrrolidone having a bulk density of about 20–50 pounds per cubic foot produced according to the process of claim 7.

4,130,522

AQUEOUS COATING COMPOSITION AND PROCESS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 689,105, May 24, 1976, Pat. No. 4,035,273. This application Mar. 28, 1977, Ser. No. 781,660

Int. Cl.[2] **C08F** *265/06, 273/00, 283/04;* **C08J** *3/06*

U.S. Cl. 260—29.2 TN **16 Claims**

1. A coating composition in aqueous dispersion for forming a curable film thereof on a substrate comprising:

(a) a water-solubilized positively charged polymer produced from one having at least about 5% by weight pendant mercaptan groups; and

(b) at least about 5% by weight of said polymer of an alpha-, beta-ethylenically unsaturated carbonyl cross-linking agent having at least two pendant alpha-, beta-ethylenically unsaturated carbonyl groups,

said cross-linking agent for cross-linking said polymer by addition polymerization upon subsequent curing of said curable film on said substrate.

4,130,523

HIGH SOLIDS LATEXES

Kenneth L. Hoy, and Roland H. Peterson, both of St. Albans, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,472

Int. Cl.[2] **C08L** *31/02*

U.S. Cl. 260—29.6 R **14 Claims**

1. A process for producing an aqueous polymer latex having a high solids content which comprises the steps of:

(A) initiating latex formation by feeding an emulsion polymerizable monomer to an aqueous polymerization medium containing a sufficient amount of a polymerization catalyst to initiate polymerization of the monomer; then

(B) forming a stable seed latex by continuing to feed said emulsion polymerizable monomer to the reaction zone and simultaneously feeding to the reaction zone a polymerization catalyst and an emulsion stabilizing amount of a surfactant and buffer; then

(C) forming an intermediate latex by continuing to feed said emulsion polymerizable monomer to the reaction zone and simultaneously feeding to the reaction zone a catalyst and an emulsion stabilizing amount of a surfactant and a buffer;

(D) during steps (B) and (C) continuously withdrawing a portion of the latex being formed from the reaction zone to a storage zone, said steps (C) and (D) being conducted until the intermediate latex in the reaction zone has a solids content of from 55 to 65 volume percent; and then

(E) forming a final latex by continuing to feed said emulsion polymerizable monomer to the reaction zone and simultaneously continuously feeding the withdrawn latex to the reaction zone until the desired solids content is obtained.

4,130,524

CORROSION INHIBITING COMPOSITIONS

Fred P. Boerwinkle, St. Paul, and Tadeusz Szauer, Anoka, both of Minn., assignors to Northern Instruments Corporation, Lino Lakes, Minn.

Filed Dec. 1, 1977, Ser. No. 856,403

Int. Cl.[2] **C23F** *11/14, 11/16*

U.S. Cl. 260—29.6 HN **23 Claims**

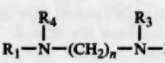
9. An aqueous coating composition comprising, in an aqueous medium:

(a) an effective amount of a first salt of a carboxylic acid and a first organic amine, wherein said acid has 8 to 20 carbon atoms and wherein said amine is selected from the group consisting of:

(i)

where R_1 is alkyl or alkenyl of 11 to 20 carbons, R_2 and R_3 are —H, $—CH_3$ or $—CH_2CH_2OH$; and

(ii)



where n is an integer of 2-4, R_4 is —H, $—CH_3$ or $—CH_2CH_2OH$; and

(b) a second salt selected from:

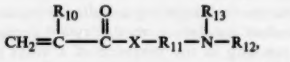
(i) salt of phosphoric acid and a second organic amine of the formula:

where R_5, R_6 and R_7 are selected from —H, alkyl and cycloalkyl, hydroxy-substituted alkyl and cycloalkyl, alkenyl and cycloalkenyl, and hydroxy-substituted alkenyl and cycloalkenyl, wherein the sum of the carbon atoms in R_5, R_6 and R_7 is in the range of 6 to 12; and

(ii) salt of said second organic amine and an alkyl acid phosphate, wherein said alkyl group has from 1 to 8 carbons; and

(c) a water dispersible polymer derived from the free-radical-initiated addition polymerization of the following monomers in the mol percentages given:

(i) an amine monomer of the formula:

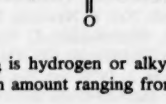


where R_{10} is —H, $—CH_3$ or $—CH_2CH_3$, R_{11} is $—CH_2CH_2—$ or $—CH_2CH_2CH_2—$, R_{12} and R_{13} are H or alkyl of 1-4 carbons, X is —O—, —NH— or —S—; present in an amount of about 40 to 100 mol percent;

(ii) an acidic monomer of the formula:

present in an amount ranging from 0 to about 50 mol percent; and

(iii)



wherein R_{14} is hydrogen or alkyl of 1 to 4 carbons; present in an amount ranging from 0 to about 20 mol percent;

wherein the total mol percent of acidic monomer in said polymer is not greater than the mol percent of said amine monomer.

4,130,525

STABLE AQUEOUS EMULSION OF ACRYLONITRILE POLYMER, ITS PRODUCTION AND DYEABILITY IMPROVING AGENT COMPRISING SUCH EMULSION

Toshiyuki Kobashi; Hirotaka Shiota, and Haruki Umetani, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Japan

Filed Feb. 25, 1977, Ser. No. 772,334
Claims priority, application Japan, Mar. 5, 1976, 51-24334
Int. Cl.[2] C08L 33/20
U.S. Cl. 260—29.6 AN 10 Claims

1. A stable aqueous emulsion of an acrylonitrile polymer which comprises a dispersion system of said acrylonitrile polymer having a particle size of substantially less than 1μ in water and contains substantially no emulsifying agent nor dispersing agent, said emulsion being produced by a process comprising; polymerizing acrylonitrile alone or in a monomer mixture comprising more than 60% by weight of acrylonitrile and as another component, at least one other ethylenically unsaturated compound, under stirring at a temperature higher than 120° C. and at least autogenous pressure, in an aqueous system consisting essentially of water in an amount of 45 to 95% by weight based on the total weight of water and monomer(s), to thereby introduce at least 2×10^{-5} mol per gram polymer of sulfonic acid groups or salts thereof and/or carboxylic groups or salts thereof into the resulting polymer, whereby an aqueous dispersion system comprising fine droplets of the polymer in substantially molten state is formed, and then cooling said aqueous dispersion system under stirring so that said polymer droplets may not gather together to form aggregates, said cooling of said aqueous dispersion system being to a temperature less than 100° C. while maintaining said system at a pressure higher than the autogeneous pressure.

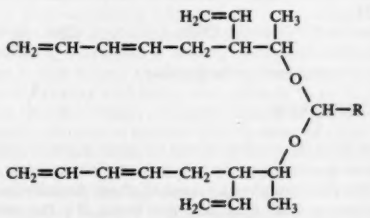
4,130,526

AQUEOUS COATING COMPOSITION

Yasuharu Nakayama; Tadashi Watanabe; Reiziro Nishida, all of Hiratsuka, and Satoru Enomoto, Tokyo, all of Japan, assignors to Kansai Paint Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,563
Claims priority, application Japan, Jul. 5, 1976, 51-80274
Int. Cl.[2] C08L 33/00
U.S. Cl. 260—29.6 RB 10 Claims

1. An aqueous coating composition which is prepared by radically polymerizing unsaturated vinyl monomer in the presence of a surface active agent of ionic or nonionic compound to produce an emulsion, and impregnating said emulsion with 0.1 to 150 parts per hundred resin solid content of said emulsion of a compound (A) represented by the general formula:



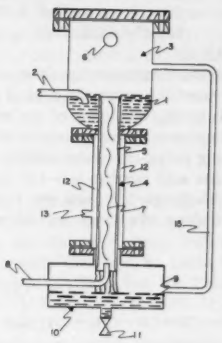
in which R is a hydrogen atom or an alkyl group having 1 to 18 carbon atoms, phenyl group, 1–18 carbon atom alkyl phenyl group, cyclohexyl group or 1–18 carbon atom alkyl cyclohexyl group.

4,130,527

METHOD OF TREATING A POLYMER LATEX TO REMOVE UNREACTED MONOMER BY TREATMENT IN A COLUMN

Robert S. Miller, Chappaqua, N.Y., and Francis J. Doyle, Newark, Del., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 29, 1977, Ser. No. 865,648
Int. Cl.[2] C08L 27/00
U.S. Cl. 260—29.6 R 10 Claims



1. A process for removal of unreacted, residual monomer from an aqueous latex of polymer which comprises introducing the latex without any substantial mechanical shear stress being imparted thereto to a substantially vertical column so that it flows down the interior surface of said column in a thin film countercurrent to a flow of steam while being maintained at subatmospheric pressure.

4,130,528

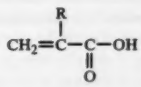
CARBOXYLATED NEOPRENE LATEX CONTAINING ALKALI-PRETREATED ZINC OXIDE OR HYDROXIDE

Mark C. Chen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 2, 1977, Ser. No. 847,932
Int. Cl.[2] C08L 11/02, 33/02
U.S. Cl. 260—29.7 WA 10 Claims

1. A neoprene composition comprising as its essential components:

(1) a latex obtained by polymerizing in an emulsion substantially free of carboxylic soaps a mixture of chloroprene with a carboxylic acid having the formula



where R is hydrogen, an alkyl radical containing 1–4 carbon atoms, or a carboxymethyl radical, the proportion of said acid being about 0.4–10 mole percent of the total monomer content, in the presence of

(a) about 3–10 parts of polyvinyl alcohol and

(b) about 0.3–2 parts of a chain transfer agent selected from dialkyl xanthogen disulfides and alkyl mercaptans,

both (a) and (b) being expressed in parts by weight based on 100 parts of total monomers, the polymer in the latex containing 10–95% gel, polyvinyl alcohol not being completely recoverable by extraction of the polymer with water; and

(2) about 2–10 parts of a zinc compound selected from zinc oxide and zinc hydroxide based on the copolymer content of the latex, and zinc compound having been previously contacted with an aqueous solution of an alkali metal hydroxide selected from NaOH, KOH, and LiOH, the respective proportions of these ingredients being about

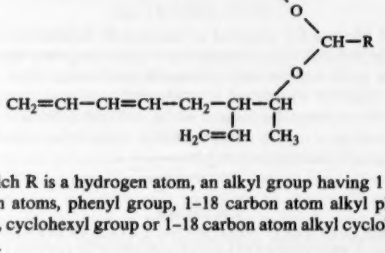
0.5–10 moles of zinc compound per mole of alkali metal hydroxide.

4,130,529
AQUEOUS FILM-FORMING COMPOSITION

Yasuharu Nakayama; Tadashi Watanabe; Reiziro Nishida, all of Hiratsuka, and Satoru Enomoto, Tokyo, all of Japan, assignors to Kansai Paint Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,559
Claims priority, application Japan, Jul. 5, 1976, 51-80273
Int. Cl.[2] C08L *9/00*
U.S. Cl. 260—29.7 UA **10 Claims**

1. An aqueous film-forming composition which is prepared by radically polymerizing unsaturated vinyl monomer which produces radicals having a Q value of not less than 0.1 in the Q-e scheme in the presence of an amount of emulsion stabilizer of oxidation curing polymeric water-soluble resin to produce an emulsion whose acid number is 3–150, and impregnating said emulsion with 0.1 to 150 parts per hundred resin solid content of said emulsion of a compound (A) represented by the general formula:



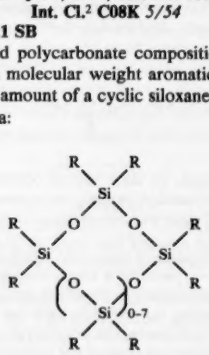
in which R is a hydrogen atom, an alkyl group having 1 to 18 carbon atoms, phenyl group, 1–18 carbon atom alkyl phenyl group, cyclohexyl group or 1–18 carbon atom alkyl cyclohexyl group.

4,130,530
CYCLIC SILOXANE PLASTICIZED POLYCARBONATE COMPOSITION

Victor Mark Evansville, Ind., and Phillip S. Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 8, 1977, Ser. No. 785,822
Int. Cl.[2] C08K *5/54*
U.S. Cl. 260—29.1 SB **6 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of a cyclic siloxane plasticizer of the following formula:



wherein R is independently selected from the group consisting of C_1 to C_{36} alkyl, aryloxy of 6 to 14 carbon atoms, aralkoxy of 7 to 36 carbon atoms, halogen substituted aryl of 6 to 14 carbon atoms and C_5 to C_{30} alkyl substituted aryl of 6 to 14 carbon atoms, wherein said alkyl substituted aryl is bonded to said silicon atom through an intervening oxygen atom.

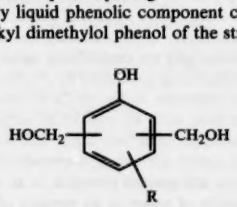
4,130,531
HIGH SOLIDS, LOW VISCOSITY THERMOSETTING PHENOLIC/EPOXY COATING SYSTEM

Frederick C. Purcell, Johnstown, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 519,507, Oct. 31, 1974, abandoned, and Ser. No. 571,979, Apr. 28, 1975, abandoned. This application Oct. 22, 1975, Ser. No. 624,819
Int. Cl.[2] C08J *3/24;* C08L*/61/04;* C08K *5/04;* C08L *63/00*
U.S. Cl. 260—31.4 EP **20 Claims**

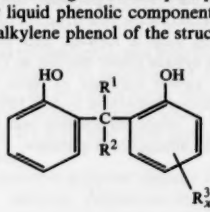
1. A curable coating composition having a viscosity of between 100 and 1000 cps comprising:

(a) a normally liquid phenolic component consisting essentially of alkyl dimethylol phenol of the structure:



where R is an alkyl group containing 1–16 carbon atoms in the para or ortho position and where the methylol groups are in the 2 remaining ortho and para positions;

(b) a normally liquid phenolic component consisting essentially of an alkylene phenol of the structure:



where R^1 and R^2 are methyl or hydrogen, x is 1 or 2 and R^3 is an alkyl group containing 1–16 carbon atoms;

(c) a normally liquid 1,2 - epoxy component consisting of an aliphatic epoxy compound, an epoxy compound containing aromaticity or mi tures thereof and having an epoxy equivalent of between .50 and 200;

(d) 3–25% of the combined weight of (a), (b), (c) and (d) of a non-volatile polyol;

(e) less than 25% of the combined volume of (a), (b), (c), (d) and (e) of a non-reactive organic solvent; and

(f) an amine catalyst.

4,130,532
POLYESTER PLASTICIZERS

Frank Lamb, Oldham, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 603,999, Aug. 12, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 774,727
Claims priority, application United Kingdom, Aug. 21, 1974, 36726/74
Int. Cl.[2] C07C *69/34;* C08K *5/11, 5/12;* C08L *27/06*
U.S. Cl. 260—31.6 **12 Claims**

1. A polyester having the formula

$$M(P)_a(D)_b(L)_cM \qquad I$$

in which M is the residue of one or more aliphatic monocarboxylic acids containing from 4 to 12 carbon atoms or one or more saturated straight or branched chain monohydric alcohols containing from 4 to 12 carbon atoms, P is the residue of one or more saturated straight or branched chain aliphatic diols containing from 2 to 4 carbon atoms, D is the residue of a mixture of one or more aliphatic dicarboxylic acids containing from 4 to 6 carbon atoms and a proportion above 10 mole % of the total acids used, of one or more aromatic dicarboxylic

acids or anhydrides selected from the group consisting of o-phthalic acid, phthalic anhydride and isophthalic acid, L is the residue of 6-hydroxy caproic acid, each of the residues being joined together by ester linkage, residues P, D and L being distributed at random throughout the molecule, a, b and c each having a value greater than 0, the amount of residue of hydroxy acid being from 10 mole % to 90 mole % based on the total number of moles of reactants and the molar ratios of the remaining reactants being chosen so that the average molecular weight of the product is from 500 to 1400, which is prepared by reacting in one-step a mixture of the following components (a) from 10 to 90 mole % of epsilon caprolactone or the corresponding hydroxy acid, (b) a hydroxylic component which comprises one or more saturated straight or branched chain aliphatic diols containing from 2 to 4 carbon atoms, (c) an acidic component which comprises a mixture of one or more aliphatic dicarboxylic acids containing from 4 to 6 carbon atoms and a proportion above 10 mole % of the total acids used of one or more aromatic dicarboxylic acids or anhydrides selected from the group consisting of o-phthalic acid, phthalic anhydride and isophthalic acid, and, (d) one or more aliphatic monocarboxylic acids containing from 4 to 12 carbon atoms or one or more saturated straight or branched chain monohydric alcohols containing from 4 to 12 carbon atoms such that the hydroxylic components are used in stoichiometric amounts or up to 20% excess over the stoichiometric amounts related to the acidic components.

11. A composition comprising (a) a thermoplastic polymer selected from the group consisting of poly(vinyl chloride) and poly(vinyl chloride) copolymers and (b) a plasticizing amount up to 60% by weight of the plasticized composition of a polyester according to claim **1**.

4,130,533

POLYESTER PLASTICIZERS

Frank Lamb, Oldham, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 540,375, Jan. 13, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,601

Claims priority, application United Kingdom, Mar. 28, 1974, 13772/74

Int. Cl.[2] **C07C** *69/76;* **C08K** *5/11, 5/12;* **C08L** *27/06*

U.S. Cl. 260—31.6 **14 Claims**

1. A compound, having the formula

$$A(P)_a(D)_b(L)_cA \qquad (I)$$

in which A is the residue of one or more saturated straight or branched chain monohydric alcohols containing from 1 to 20 carbon atoms, P is the residue of one or more saturated straight or branched chain aliphatic diols containing from 2 to 6 carbon atoms, D is the residue of one or more acids or anhydrides selected from the group consisting of o-phthalic acid, phthalic anhydride, isophthalic acid, tetrahydrophthalic acid, tetrahydrophthalic anhydride and any of the aforementioned acids or anhydrides substituted with 1 to 4 alkyl groups, said alkyl groups containing 1 to 4 carbon atoms, or with 1 to 4 chlorine or bromine atoms, L is the residue of one or more saturated hydroxy acids containing from 4 to 12 carbon atoms, each of the residues being joined together by ester linkages residues P, D and L being distributed at random throughout the molecule, a, b and c each having a value greater than 0, the amount of residue of hydroxy acid being from 10 mole % to 90 mole % based on the total number of moles of reactants and the ratio of the number of moles of alcohol to the number of moles of diol being from 2.2 to 0.93 such that the average molecular weight is from 500 to 1400, which is prepared by reacting in one-step a mixture of the following components (a) from 10 to 90 mole % of lactone or hydroxy acid containing from 4 to 12 carbon atoms (b) from 22 to 2 mole % of a hydroxylic component which comprises one or more saturated straight or branched chain aliphatic diols containing from 2 to 6 carbon atoms c) from 33 to 12 mole % of an acidic component which comprises one or more acids or anhydrides selected from the group consisting of o-phthalic acid, phthalic anhydride, isophthalic acid, tetrahydrophthalic acid, tetrahydrophthalic anhydride and any of the aforementioned acids or anhydrides substituted with 1 to 4 alkyl groups, said alkyl groups containing 1 to 4 carbon atoms, or with 1 to 4 chlorine or bromine atoms, and d) one or more saturated straight or branched chain monohydric alcohols containing from 1 to 20 carbon atoms such that the hydroxylic components are used in stoichiometric amounts or up to 15% excess over the stoichiometric amounts related to the acidic components.

14. A composition comprising (a) a thermoplastic polymer selected from the group consisting of poly(vinyl chloride) and poly(vinyl chloride) copolymers and (b) a plasticizing amount up to 60% by weight of the plasticized composition of a compound according to claim **1**.

4,130,534

ELASTOPLASTIC COMPOSITIONS OF BUTYL RUBBER AND POLYOLEFIN RESIN

Aubert Y. Coran, and Raman P. Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1976, Ser. No. 754,412

Int. Cl.[2] **C08F** *299/00;* **C08L** *23/22*

U.S. Cl. 260—33.6 AQ **13 Claims**

1. An elastoplastic composition comprising a blend of from about 20 to 45 parts by weight of thermoplastic crystalline polyolefin resin and from about 80 to 55 parts by weight of butyl rubber, chlorobutyl rubber, or bromobutyl rubber per 100 total parts by weight of polyolefin resin and rubber wherein the rubber is dispersed particles of cross-linked rubber which composition is processable as a thermoplastic and is elastomeric.

4,130,535

THERMOPLASTIC VULCANIZATES OF OLEFIN RUBBER AND POLYOLEFIN RESIN

Aubert Y. Coran; Baibhadra Das, and Raman P. Patel, all of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 597,639, Jul. 21, 1975, abandoned. This application Apr. 30, 1976, Ser. No. 679,812

Int. Cl.[2] **C08L** *23/16, 23/32*

U.S. Cl. 260—33.6 AQ **52 Claims**

1. A thermoplastic elastomeric composition comprising a blend of about 25 to about 85 parts by weight of crystalline thermoplastic polyolefin resin and about 75 to about 15 parts by weight of vulcanized monoolefin copolymer rubber per 100 parts total weight of said resin and rubber, and extender oil up to 300 parts by weight per 100 parts by weight of rubber provided that, when the amount of resin is greater than 75 parts by weight, extender oil must be present in an amount sufficient to satisfy the equation $(W_o + W_R)/W_P$ is equal to or greater than 0.33 wherein W_o is the weight of extender oil, W_R is the weight of rubber and W_p is the weight of resin, wherein the rubber in said blend is a polymer of monomers comprising ethylene or propylene, and at least one other alpha olefin of the formula $CH_2 = CHR$ in which R is alkyl of 1–12 carbon atoms and from none to a minor portion of at least one copolymerizable diene in the form of small dispersed particles essentially of a size of about 50 microns or below and is vulcanized to the extent that no more than about three percent of the rubber is extractable in cyclohexane at 23° C. or that the cross-link density determined on the same monoolefin copolymer rubber as in the blend is greater than about 7×10^{-5} moles per ml of rubber, the composition being processable in an internal mixer to a product which, upon transferring, with the resin in the molten state, to the rotating rolls of a rubber mill forms an essentially continuous sheet.

4,130,536

HIGH HUMIDITY RESISTANT ELECTRICAL GRADE POLYMER CONCRETE

David H. Reighter, Roslyn, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 13, 1977, Ser. No. 841,724
Int. Cl.[2] C08L 63/00
U.S. Cl. 260—37 EP 10 Claims

1. An electrical insulation grade polymer containing concrete comprising a polymer and a silane treated crushed electrical insulation grade porcelain aggregate.

4,130,537

ASBESTOS FREE FRICTION ELEMENT

George J. Bohrer, Pittsburgh, Pa., assignor to H. K. Porter Company, Inc., Pittsburgh, Pa.

Filed Feb. 2, 1977, Ser. No. 765,006
Int. Cl.[2] C08K 3/40, 5/06
U.S. Cl. 260—38 37 Claims

1. In a composition for use in forming an asbestos free friction element which exhibits aggressive behavior during operation, said composition including a cross-linkable polymeric binder and glass fibers, the improvement comprising:

infusible organic fibers in said composition to mitigate said aggressive behavior, said infusible organic fibers being present in the range of 10 to 185 percent by weight based on the weight of the glass fibers.

4,130,538

PREPARATION OF SMOKE AND FLAME RETARDANT RESINOUS COMPOSITIONS

Thomas C. Shutt, St. Louis, Mo., assignor to Vitrofil Corporation, Denver, Colo.

Filed Sep. 19, 1977, Ser. No. 834,741
Int. Cl.[2] C08K 3/22, 3/34, 3/40
U.S. Cl. 260—40 R 46 Claims

1. Composition for providing improved smoke and flame retardant high structural strength resinous products comprising an admixture of resin, fractured finely ground solid powder particles of soda-containing silicate glass having a high and irregular surface area and an average particle size below about 40 mesh, and a finely divided solid oxidic boron material capable of forming inert glass upon being heated and having an average particle size below about 40 mesh, said boron material being present in an effective amount for imparting an active cured resin flame retarding property, and said boron material and particles of glass correspondingly being present in a combined effective amount for imparting an active cured resin smoke retarding property.

4,130,539

PROCESS FOR THE PRODUCTION OF READILY DISPERSIBLE PREPARATIONS OF DYES AND POLYVINYLACETALS

Jacques E. Wegmann, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Switzerland

Filed Oct. 8, 1976, Ser. No. 730,967
Int. Cl.[2] C08J 3/20
U.S. Cl. 260—42.55 17 Claims

1. A process for producing a readily dispersible, non-dusty dye preparation in granulated form, which consists essentially of:

a. forming a dispersion of a difficultly water soluble to water insoluble dye, pigment or optical brightener with 5 to 60% by weight, based on the weight of said dye, pigment or optical brightener, of a water insoluble polyvinylacetal carrier resin and a polar organic solvent soluble in water between 1 and 30% on a weight/volume basis;

b. adding water to the dispersion of a., under vigorous aggitation whereby the particles of said dye, pigment or optical brightener are precipitated;

c. separating said particles from said water and organic solvent and then;

d. rinsing and drying said particles.

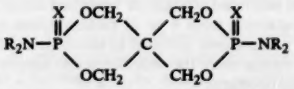
4,130,540

OLEFIN POLYMERS STABLE TO COPPER

Leo L. Valdiserri, Belpre, Ohio, and Elyse M. Bullock, Parkersburg, W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 25, 1977, Ser. No. 854,860
Int. Cl.[2] C08K 5/51
U.S. Cl. 260—45.8 R 7 Claims

1. An olefin polymer composition in contact with a copper metal article, said composition comprising a major proportion of an olefin polymer normally susceptible to deterioration at high temperatures in the presence of copper, and a minor proportion sufficient to inhibit such deterioration, of a bis-phosphoramidate having the structure



where R is the same or different alkyl, aryl or cycloalkyl or where both R's taken with the nitrogen to which they are attached are one heterocyclic radical and X is oxygen or sulfur.

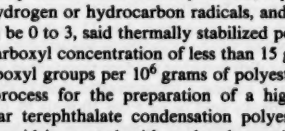
4,130,541

PRODUCTION OF THERMALLY STABILIZED POLYESTER

Stanley D. Lazarus, Petersburg, and Kalidas Chakravarti, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

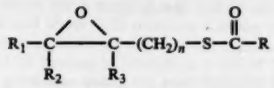
Division of Ser. No. 819,654, Jul. 27, 1977. This application Mar. 23, 1978, Ser. No. 889,572
Int. Cl.[2] C08K 5/04; C08G 63/70, 63/76
U.S. Cl. 260—45.8 A 11 Claims

1. A thermally stabilized high molecular weight linear terephthalate condensation polyester having incorporated therein a thermally stabilizing amount of a stabilizer consisting of an epoxy compound having 5 to 25 carbon atoms in the molecule and selected from the group having the formula



where R represents the radical remaining after removal of the carboxyl group from a monocarboxylic acid, R_1, R_2, and R_3 represent hydrogen or hydrocarbon radicals, and n is an integer that can be 0 to 3, said thermally stabilized polyester having a free carboxyl concentration of less than 15 gram equivalents of carboxyl groups per 10^6 grams of polyester.

6. In a process for the preparation of a high molecular weight linear terephthalate condensation polyester wherein terephthalic acid is reacted with a glycol containing 2 to 10 carbon atoms per molecule under esterification conditions and the resulting esterification product is polycondensed, the improvement which comprises providing a reduction in the free carboxyl content of the polyester to a carboxyl concentration of less than 15 gram equivalents per 10^6 grams of polyester by adding to the polyester after final polycondensation of the polyester a thermally stabilizing amount of a stabilizer comprising an epoxy compound having 5 to 25 carbon atoms in the molecule and selected from the group having the formula



where R represents the radical remaining after removal of the carboxyl group from a monocarboxylic acid, R_1, R_2, and R_3 represent hydrogen or hydrocarbon radicals, and n is an integer from 0 to 3.

4,130,542

POLYURETHANES STABILIZED AGAINST ULTRAVIOLET LIGHT AND NITROGEN OXIDE DETERIORATION

Eugene Y. C. Chang, and Samuel Kaizerman, both of Bridgewater Township, Somerset County, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 567,567, Apr. 14, 1975, abandoned, which is a continuation of Ser. No. 349,335, Apr. 9, 1973, abandoned. This application May 26, 1976, Ser. No. 690,126

Int. Cl.[2] C08K *5/29, 5/13;* **C08L** *75/04*

U.S. Cl. 260—45.9 KB **11 Claims**

1. A polyurethane polymer stabilized against the deteriorative effects of ultraviolet light and nitrogen oxides, which comprises a polyurethane polymer and a stabilizing amount of an aliphatic isocyanate selected from the group consisting of alkylisocyanates, alkylenediisocyanates, cycloalkylisocyanates and cycloalkylenediisocyanates, said polyurethane polymer comprising an isocyanate terminated prepolymer obtained by reacting a polyether or a polyester with an excess of an aromatic diisocyanate, forming an emulsion thereof and subsequently chain-extending the prepolymer with water.

4,130,543

AR-CYCLIC SULFONIUM ARENETHIOL SALTS AND THEIR ZWITTERIONS

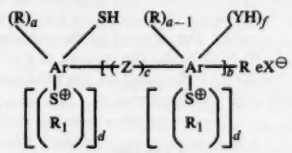
George A. Doorakian, Bedford, and Lawrence G. Duquette, Maynard, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 5, 1976, Ser. No. 673,579

Int. Cl.[2] C08G *65/44*

U.S. Cl. 528—125 **14 Claims**

1. An ar-cyclic sulfonium mercaptoarene salt represented by the formula:



wherein each Ar is independently a cyclic aromatic polyyl, each Y is independently sulfur or oxygen, each R is independently a suitably inert monovalent radical capable of existing as a ring substituent on Ar, each R_1 is independently a suitably inert divalent organic radical capable of forming a heterocyclic ring containing $-S^{\oplus}-$ in which heterocyclic ring any other heteroatom is S or O, each Z is independently a suitably inert divalent radical bridging the substituted Ar groups, X is a neutralizing anion, each a is independently a positive number corresponding to the number of remaining available ring positions on Ar, b is 0 or a positive number, c is 0 or 1, each d is independently 1 or Z, e is a number such that the salt is electrically neutral and each f is independently 0 or 1.

4,130,544

OXIDATIVE COUPLING OF PHENOLIC MONOMERS BY THE PROGRAMMED ADDITION OF COMPLEXED MANGANESE CATALYSTS

Walter K. Olander, Mt. Vernon, Ind., assignor to General Electric, Pittsfield, Mass.

Filed Aug. 8, 1977, Ser. No. 823,103

Int. Cl.[2] C08G *65/44*

U.S. Cl. 528—215 **25 Claims**

1. In a process for the preparation of a polyphenylene oxide resin by the oxidative coupling of a phenolic monomer in the presence of oxygen and a complex manganese catalyst, the improvement which comprises adding the catalyst to the reactor in incremental amounts during the polymerization reaction.

4,130,545

MELT PROCESSABLE THERMOTROPIC WHOLLY AROMATIC POLYESTER COMPRISING BOTH PARA-OXYBENZOYL AND META-OXYBENZOYL MOIETIES

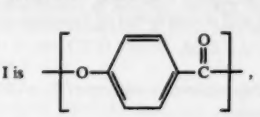
Gordon W. Calundann, North Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

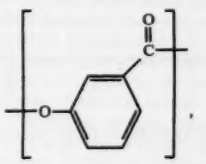
Filed Sep. 12, 1977, Ser. No. 832,713

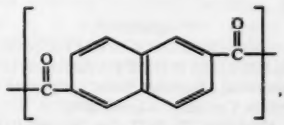
Int. Cl.[2] C08G *63/18, 63/60, 63/66*

U.S. Cl. 260—40 P **18 Claims**

1. A melt processable wholly aromatic polyester capable of forming a thermotropic melt phase at a temperature below approximately 310° C., consisting essentially of the recurring moieties I, II, III, and IV wherein:

I is  ,

II is  ,

III is  , and

and IV is a symmetrical dioxy aryl moiety of the formula $-O-Ar-O-$ where Ar is a divalent radical comprising at least one aromatic ring, wherein said polyester comprises approximately 30 to 70 mole percent of moiety I and approximately 3 to 10 mole percent of moiety II.

4,130,546

THERMOSETTING RESIN COMPOSITION

Kazuo Goto, Hitachi; Shinichi Toyoda, Katsuta, and Masahiko Sakai, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Oct. 18, 1977, Ser. No. 843,206

Claims priority, application Japan, Oct. 19, 1976, 51-125227; Oct. 21, 1976, 51-126645; Oct. 30, 1976, 51-131418; Nov. 4, 1976, 51-132553

Int. Cl.[2] C08L *63/00*

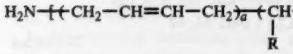
U.S. Cl. 528—73 **11 Claims**

1. A thermosetting resin composition comprising
(a) one or more polyfunctional epoxy compounds,
(b) one or more polyfunctional isocyanates,

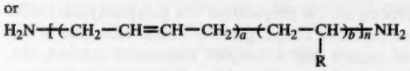
(c) one or more curing agents, and

(d) at least one flexibility imparting agent selected from the group consisting of

a polymer of butadiene having terminal amino groups represented by the formula:

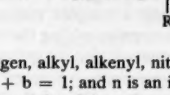


or



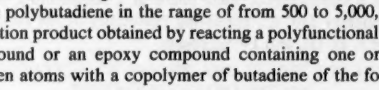
wherein R is hydrogen, alkyl, alkenyl, nitrilo, or phenyl; a ≧ 0.7, b ≦ 0.3, and a + b = 1; and n is an integer which determines the molecular weight of the polymer of butadiene in the range of from 500 to 5,000,

a polybutadiene having terminal hydroxyl groups represented by the formula:

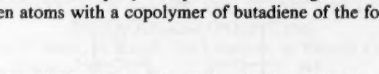


wherein n is an integer which determines the molecular weight of the polybutadiene in the range of from 500 to 5,000,

a reaction product obtained by reacting a polyfunctional epoxy compound or an epoxy compound containing one or more halogen atoms with a copolymer of butadiene of the formula:



or



wherein X is hydroxyl or carboxyl; and R, a, b and n are as defined above.

4,130,547

CHEMICAL MODIFICATION OF POLY(BIS-ARYLOXYPHOSPHAZENE) WITH AMINES

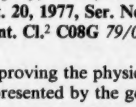
John W. Fieldhouse, Mogadore, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 20, 1977, Ser. No. 844,018

Int. Cl.[2] C08G *79/04*

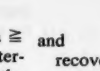
U.S. Cl. 260—823 **13 Claims**

1. A process for improving the physical properties of phosphazene polymers represented by the general formula

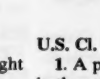


in which Q and Q′ are each selected from the group consisting of alkyl, alkylaryl and aryl and may be substituted or not, and some of which contain some unsaturation, and n is an integer between about 20 and about 50,000, which polymers are initially tough, fibrous materials which comprises;

adding to the phosphazene polymer between 1 and 10 parts by weight of an amine per 100 parts by weight of phosphazene polymer, said amine being selected from the group consisting of quinolines and amines represented by the general formula



wherein R is selected from the group consisting of H, alkyl, and cycloalkyl; R′ is selected from the group consisting of aryl and H; R″ is selected from the group consisting of aryl and aryl substituted in the ortho, meta or para position with —NHR or



and

recovering the amine modified phosphazene polymer as a relatively soft, readily processed elastomer.

4,130,548

PREPARATION OF POLYESTER CARBONATES FROM POLYANHYDRIDE ESTER INTERMEDIATES

John E. Kochanowski, Hinsdale, Mass., assignor to General Electric, Pittsfield, Mass.

Filed Oct. 21, 1977, Ser. No. 844,285

Int. Cl.[2] C08G *63/62*

U.S. Cl. 528—197 **16 Claims**

1. A process for the preparation of a copolyester containing both carboxylate and carbonate groups, said process comprising:

(a) forming a polymeric mixed anhydride ester from by contacting a salt of a di carboxylic acid with a halogen acid ester of a polyhydroxy compound;

(b) contacting said polymeric mixed anhydride ester with at least one molar equivalent of a dihydroxy compound; and

(c) thereafter contacting the excess of the dihydroxy compound with a carbonate forming reagent to form the copolyester containing both carboxylate and carbonate groups.

4,130,549

PROCESS FOR PREPARING EPOXY RESINS FROM HYDROXY BENZOIC ACID AND BISPHENOL

Ryuzo Ueno, Nishinomiya, and Hiroyasu Matsumoto, Sakai, both of Japan, assignors to Kabushiki Kaisha Venoseiyaku oyo Kenkyuso, Osaka, Japan

Filed Feb. 21, 1978, Ser. No. 879,520

Claims priority, application Japan, Mar. 7, 1977, 52/23965

Int. Cl.[2] C08G *59/24*

U.S. Cl. 528—93 **5 Claims**

1. A process for preparing an epoxy resin, which comprises reacting p-hydroxybenzoic acid and bisphenol A with an epihalohydrin in the presence of a base using a quaternary ammonium salt as a catalyst, the amount of the p-hydroxybenzoic acid being 10 to 90 mole% and the amount of the bisphenol A being 90 to 10 mole%, both based on the total amount of the hydroxybenzoic acid and bisphenol A.

4,130,550

PHENOL-FORMALDEHYDE COMPOSITION USEFUL AS A RAW MATERIAL FOR THE PREPARATION OF PHENOLIC RESINS

Yoshihiro Kitsuda, and Takahisa Kouyama, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Continuation of Ser. No. 711,670, Aug. 4, 1976, abandoned. This application Mar. 2, 1978, Ser. No. 883,083

Claims priority, application Japan, Aug. 4, 1975, 50-95259; Aug. 7, 1975, 50-96460

Int. Cl.[2] C08G *8/10*

U.S. Cl. 260—29.3 **6 Claims**

1. A process for preparing water-soluble resols which comprises carrying out a reaction to form resols in a composition

comprising, as a main component, one or more phenols, about 1 to about 3 moles per 1 mole of said one or more phenols of formaldehyde and about 0.05 to about 4 moles per 1 mole or said one or more phenols of water in the presence of calcium hydroxide and/or barium hydroxide at a pH of 7.5 to 9.

4,130,551

SOLID STATE POLYMERIZATION

Ronald E. Bockrath, Aurora, and Carl Serres, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 21, 1974, Ser. No. 525,866
Int. Cl.[2] C08G *63/70*
U.S. Cl. 528—481 **3 Claims**

1. The method of producing a relatively high inherent viscosity polyester resin without agglomeration which comprises polymerizing a polyester having an initial starting inherent viscosity of about 0.3 dl/g in 60:40 phenol:tetrachloroethane at 30° C. and at 0.4 dl/g under solid state polymerization conditions together with a sodium chloride anti-stick agent and removing said sodium chloride from the polyester after solid state polymerization with an aqueous medium, wherein the sodium chloride anti-stick agent is present in a concentration of 0.05 to 10 parts by weight per each 100 parts by weight polyester.

4,130,552

POLYESTER CATALYST SYSTEM AND PROCESS

Ronald L. Muntz, Bedford Hills, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 729,752, Oct. 5, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 828,052
Int. Cl.[2] C08G *63/32*
U.S. Cl. 528—285 **6 Claims**

1. A process for preparing polyester comprising condensing glycol terephthalate in the presence of a polycondensation catalyst system consisting essentially of the reaction product of an unsaturated α, β-dicarboxylic acid anhydride having 4 to 12 carbon atoms and an antimony alkoxide.

4,130,553

PROCESS FOR IMPROVING THE NUTRITIONAL VALUE OF GREEN PLANT PROTEIN

William R. Batley, Jr., P.O. Box 216, Brawley, Calif. 92227, and Walter J. Bray, 510 Pine Top Trail, Bethlehem, Pa. 18017

Filed Jan. 5, 1977, Ser. No. 757,011
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—112 R **27 Claims**

1. In a process for recovering protein from leafy green plants comprising the steps of (1) extracting from freshly cut leafy green plants a chloroplastic and cytoplasmic protein containing juice at a temperature of less than about 60° C., (2) separating the insoluble matter from said juice, (3) coagulating the protein in said juice, and (4) recovering the coagulated protein, wherein the improvement comprises the step of, prior to said step (2), contacting said protein containing juice with a quantity of an alkaline solution sufficient to raise the pH of said juice to within the range of from greater than 8.5 to less than 12.0 for a sufficient time to allow conversion of a portion of the chloroplastic protein to soluble cytoplasmic protein whereby at least about 50% of the total protein recovered from the process is cytoplasmic protein.

4,130,554

PROCESS FOR PREPARING SOMATOSTATIN ANALOG

Frederick W. Holly, Glenside; William J. Paleveda, Lansdale; Robert G. Strachan, Warrington, and Daniel F. Veber, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 8, 1975, Ser. No. 566,150
Int. Cl.[2] C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 R **9 Claims**

1. The peptide having the structure: S-Acm-β-mercaptopropionyl-(ϵ-INOC)Lys-Asn-Phe-Phe-Trp-(ϵ-INOC)Lys-Thr-Phe-Thr-Ser-(Acm)Cys-OH.

4,130,555

PEPTIDE MIXTURES DERIVED FROM COLLAGENOUS MATERIAL OR GELATIN

Kazumasa Ohtsuka, Yokohama; Zen Mitsui, Kana, and Hajime Wada, Tokyo, all of Japan, assignors to Nippi Incorporated, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 830,763
Int. Cl.[2] A23J *1/10*; C09H *3/00*
U.S. Cl. 260—117 **12 Claims**

1. A peptide mixture prepared by hydrolyzing a collagen-containing material or gelatin which has a number average molecular weight of from 300–500 and contains 40–60 hydroxylysine plus lysine residues, 55–70 arginine residues, 360–390 glycine residues 50–70 proline residues and 60–80 hydroxyproline residues per 1,000 amino acid residues; pouring the hydrolysate into a column filled with a cation-exchange resin; eluting the peptide absorbed on the resin with an alkaline solution; and collecting and condensing the eluate.

4,130,556

CHEMICAL PRODUCTS AND METHODS

Michael P. Wachter, Bloomsbury, and Ramesh M. Kanojia, Somerville, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 672,918, Apr. 2, 1976, Pat. No. 4,086,358, and a continuation-in-part of Ser. No. 547,415, Feb. 6, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 838,527
Int. Cl.[2] C07G *17/00*; C07D *301/00*; A61K *35/78, 31/335*
U.S. Cl. 260—236.5 **16 Claims**

1. The method of purifying crude extracts containing biologically active materials obtained from the zoapatle plant selected from the species consisting of *Montanoa tomentosa* and *Montanoa floribunda* which comprises the steps of:

dissolving the crude extract in a water-immiscible organic solvent, washing the resulting solution with an aqueous solution of a mild base and separating the organic phase from the aqueous phase, chromatographing the solution through a column of adsorbent material, eluting the column with a mixture of a polar and a non-polar solvent, combining the fractions containing biologically active materials and removing the solvent therefrom, dissolving the residue in a water-immiscible organic solvent, chromatographing the solution through a column of an organic polymeric gel, eluting the column with a non-polar organic solvent and collecting the fractions containing biologically active materials.

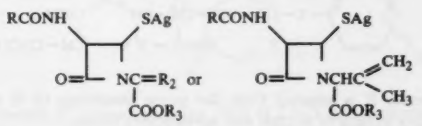
4,130,557

METHOD FOR THE HYDROLYSIS OF AZETIDINOTHIAZOLINE COMPOUNDS

Yoshio Hamashima, Kyoto; Teruji Tsuji, Takatsuki; Mitsuru Yoshioka, Toyonaka; Masayuki Narisada, Ibaraki; Taichiro Komeno; Hiroshi Tanida, both of Osaka, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Japan

Filed Jan. 29, 1976, Ser. No. 653,629
Claims priority, application Japan, Jan. 30, 1975, 50-13157
Int. Cl.[2] C07D *205/08, 403/04*; B01J *1/10*
U.S. Cl. 260—239 A **5 Claims**

1. A process for preparing compounds having the formula:

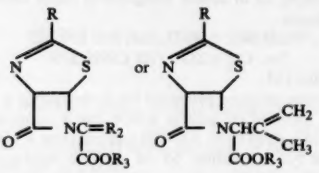


wherein R is phenoxymethyl or benzyl;

R_2 is 1-methoxyethylidene, 1-hydroxyethylidene, or 1,1-dimethoxyethylidene; and

R_3 is trichloroethyl, diphenylmethyl, p-nitrobenzyl, trityl, phenyl, naphthyl, or trimethylstannyl;

which comprises treating a compound of the following formula:



wherein R, R_2 and R_3 are as defined above,

with $AgClO_4$, $AgBF_4$, $AgIO_4$, $AgPF_6$, CF_3COOAg, CH_3SO_3Ag, CF_3SO_3Ag, CH_3COOAg, or $AgNO_3$ in aqueous dioxane, aqueous tetrahydrofuran or mixtures thereof.

4,130,558

PROCESS FOR PREPARATION OF ALKALI METAL SALTS OF AMPICILLIN

Otto Roos, Ingelheim am Rhein, and Dieter Essig, Bad Kreuznach, both of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed May 18, 1977, Ser. No. 797,928

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623835

Int. Cl.² C07D *499/68*

U.S. Cl. 260—239.1 **2 Claims**

1. The method of preparing an alkali metal salt of ampicillin, which comprises the steps of adding to a liquid aqueous suspension of ampicillin at a temperature not exceeding about 4° C. an aqueous solution of an equimolar amount or up to 10% less than an equimolar amount, based on the ampicillin, of an alkali metal base or basic alkali metal salt, while avoiding local over-alkalization in the suspension, immediately sterile-filtering the resulting aqueous solution, immediately freezing the filtrate, and lyophilizing the frozen filtrate.

4,130,559

METHC) FOR THE PREPARING OF 6-AMINOPENICILLINIC ACID DERIVATIVES

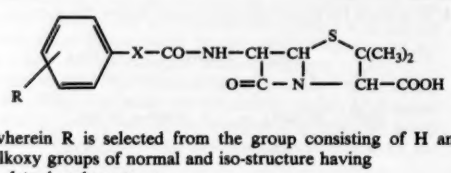
Maia G. Tsinker, ulitsa Amiriana 34, kv. 13; Julya Z. Ter-Zakharian, ulitsa Tumaniana 5, kv. 6; Shushanik G. Oganian, ulitsa Khandzhiana 43, kv. 8; Aram R. Ovakimian, ulitsa Alabiana 39, kv. 47; Shushanik L. Mndzhoian, ulitsa Sundukiana, 1, kv. 2, all of Erevan, U.S.S.R.; Armenak L. Mndzhoian, deceased, late of Erevan, U.S.S.R., by Alza A. Mndzhoian, administratrix, ulitsa Barekamutina, 118, Kv. 24, Erevan, U.S.S.R.

Continuation of Ser. No. 687,211, May 17, 1976, abandoned, which is a continuation of Ser. No. 566,824, Apr. 10, 1975, abandoned. This application Mar. 15, 1977, Ser. No. 777,631

Int. Cl.² C07D *499/46*

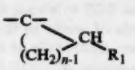
U.S. Cl. 260—239.1 **1 Claim**

1. 6-aminopenicillanic acid derivatives having the general formula:



wherein R is selected from the group consisting of H and alkoxy groups of normal and iso-structure having 1 to 4 carbon atoms;

X is selected from the group consisting of



wherein n = 4, 3, 2; **and**

R_1 is selected from the lower alkyls, phenyl, benzyl, halogen, NH_2, NO_2, and OH.

4,130,560

DICARBOXYLIC ACID DERIVATIVES CONTAINING HETEROCYCLIC RADICALS

Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

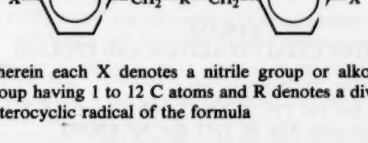
Filed Nov. 20, 1975, Ser. No. 633,772

Claims priority, application Switzerland, Nov. 29, 1974, 18565/74

Int. Cl.² C07D *239/52, 239/64, 233/72, 233/96*; C09K *5/06*

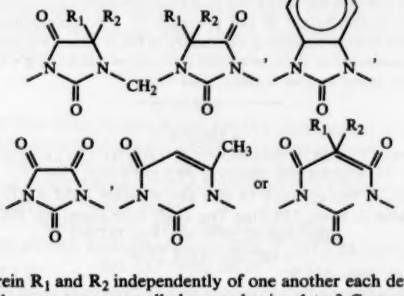
U.S. Cl. 544—302 **10 Claims**

1. A compound of formula I



(I)

wherein each X denotes a nitrile group or alkoxycarbonyl group having 1 to 12 C atoms and R denotes a divalent N,N-heterocyclic radical of the formula



wherein R_1 and R_2 independently of one another each denote a hydrogen atom or an alkyl group having 1 to 3 C atoms.

4,130,561

POLYCYCLOANILINES

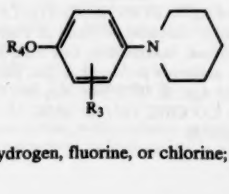
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 576,342, May 12, 1975, Pat. No. 4,036,977, which is a continuation-in-part of Ser. No. 507,462, Sep. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 416,402, Nov. 16, 1973, abandoned. This application May 26, 1977, Ser. No. 800,802

Int. Cl.² C07D *295/08*

U.S. Cl. 546—204 **5 Claims**

1. A compound of the formula



wherein R_3 is hydrogen, fluorine, or chlorine; R_4 is 1-adaman-

tyl, 2-methyl-2-adamantyl, 1-diamantyl and 4-diamantyl and pharmacologically acceptable acid addition salts thereof.

4,130,562

ODORANT OR FLAVORING THIAZOLYL DISULPHIDES

Paul Dubs, Zug, and Heiner Kuntzel, Dubendorf, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Sep. 24, 1976, Ser. No. 726,100

Claims priority, application Switzerland, Jan. 10, 1975, 12728/75; Jul. 20, 1976, 9280/76

Int. Cl.[2] C07D *277/36*; A23L *1/226*

U.S. Cl. 260—302 S **7 Claims**

1. A compound selected from the group consisting of
2-thiazolyl-methyl-disulphide,
2-thiazolyl-ethyl-disulphide,
2-thiazolyl-isopropyl-disulphide,
2-thiazolyl-butyl-disulphide,
[1-(2-thiazolyl)-2-methylpropyl]-methyl-disulphide and
[2-(4-methyl-5-thiazolyl)-ethyl]-methyl-disulphide.

4,130,563

Δ4-OXAZOLIN-2-ONES AND PROCESS THEREFOR

Karl-Heinz Scholz; Willy Hartmann, and Hans-Georg Heine, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

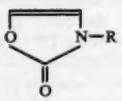
Filed Feb. 18, 1977, Ser. No. 770,259

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610676

Int. Cl.[2] C07D *263/38*

U.S. Cl. 260—307 C **2 Claims**

1. A Δ^4-oxazolin-2-one of the formula



I

in which

R is an acyl radical of the formula R_1—CO—,

in which

R_1 is C_1–C_8-alkyl; C_1–C_4-alkyl substituted by C_1–C_2-alkoxy or halogen; allyl, methallyl or cinnamyl; C_5–C_6-cycloalkyl; C_5–C_6-cycloalkyl substituted by C_1–C_4 alkyl; benzyl; benzyl substituted by C_1–C_4-alkyl, C_1–C_2-alkoxy or halogen; phenyl; phenyl substituted by C_1–C_4-alkyl, C_1–C_2-alkoxy or halogen; 1- or 2-naphthyl, 4-benzoylphenyl; C_1–C_4-alkoxy; phenoxy; phenoxy substituted by C_1–C_4-alkyl, C_1–C_2-alkoxy or halogen; C_1–C_8-alkylamino; di-C_1–C_8-alkylamino; phenylamino; or phenylamino substituted by C_1–C_4-alkyl, C_1–C_2-alkoxy or halogen.

4,130,564

PROCESS FOR THE MANUFACTURE OF MALEIMIDES

Theobald Haug, Frenkendorf; Jürg Kiefer, Reinach, and Alfred Renner, Münchenstein, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

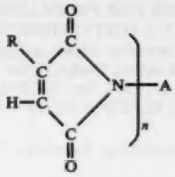
Filed Mar. 30, 1977, Ser. No. 782,681

Claims priority, application Switzerland, Apr. 9, 1976, 4535/76

Int. Cl.[2] C07D *207/00, 207/02*

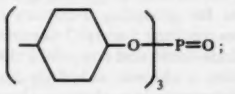
U.S. Cl. 260—326.26 **11 Claims**

1. In a process for manufacture of maleimides of the formula

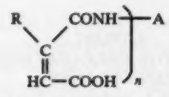


(I)

wherein n is one of the integers 1, 2 or 3, R represents hydrogen or a linear or branched alkyl having 1 to 4 carbon atoms, and where n is 1, A represents phenyl, tolyl, hydroxyphenyl, carboxyphenyl or 4-hydroxy-3,5-di-tert-butylphenyl; where n is 2, A represents alkylene of 2 to 12 carbon atoms, cyclohexylene, phenylene, naphthylene, pyridylene, xylylene or a plurality of phenylene or cyclohexylene radicals linked by a simple valence bond or by an atom or group which is inert under reaction conditions; or where n is 3, A represents



by cyclodehydrating the corresponding maleamic acid of the general formula II



(II)

in the presence of a low molecular weight, dehydrating carboxylic acid anhydride and a tertiary amine in an amount of 0.1 to 0.5 mole of amine per mole of maleamic acid group, and in the presence or absence of an organic solvent, the improvement which comprises

carrying out the cyclodehydration at a temperature between 10° C. and 50° C.

4,130,565

NOVEL TYPE OF OXA- AND THIA-STEROIDS

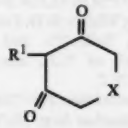
Tadao Terasawa, Ibaraki, and Toshihiko Okada, Nara, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 739,448, Nov. 5, 1976, Pat. No. 4,083,852. This application Jan. 16, 1978, Ser. No. 869,861

Int. Cl.[2] C07D *309/10, 335/02*

U.S. Cl. 260—327 TH **5 Claims**

1. A compound of the formula



wherein R^1 represents lower alkyl of 1 to 5 carbon atoms and X represents oxygen or sulfur.

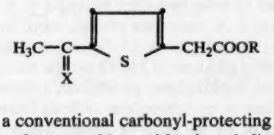
4,130,566
PROCESS FOR PRODUCING 5-CARBOXY-2-ACETYLTHIOPHENE

Toshihiko Hibino, Takarazuka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 28, 1977, Ser. No. 847,063
Int. Cl.[2] C07D 333/24
U.S. Cl. 260—332.2 C 9 Claims

1. A process for producing 5-carboxy-2-acetylthiophene which comprises

oxidizing a compound of the formula



wherein X is a conventional carbonyl-protecting group and R is a conventional ester residue, with a hypohalite in a mixture of water and an alcohol at a temperature from 0° to 60° C., and then removing the carbonyl-protecting group.

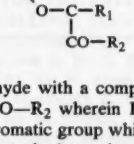
5. A process for producing 5-carboxy-2-acetylthiophene which comprises oxidizing 5-acetyl-2-thienylacetic acid with a chromic anhydride-acetic acid complex, a chromic anhydride-pyridine complex, a chromic anhydride-dimethylformamide complex or a dichromate, in a solvent at a temperature from 0° to 100° C.

4,130,567
PROCESS FOR THE PREPARATION OF ARYL DIOXOLANES

George Rosen, Wayne, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Sep. 20, 1977, Ser. No. 834,961
Int. Cl.[2] C07D 317/26
U.S. Cl. 260—340.9 R 6 Claims

1. In the process for preparing a compound having the formula



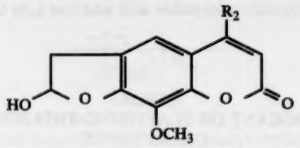
by reacting formaldehyde with a compound having the formula R_1—CHOH—CO—R_2 wherein R_1 and R_2 is each an aromatic or a heteroaromatic group which may be substituted with at least one halogen, hydroxy, lower alkyl, aryl, alkaryl, cycloalkyl, or nitro group and R_1 and R_2 may be the same or different, the improvement which comprises carrying out the reaction under autogenous pressure.

4,130,568
8-METHOXYPSORALEN DERIVATIVES

Pasquale N. Confalone; Elizabeth D. Lollar, both of Bloomfield; Giacomo Pizzolato, Belleville, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 723,116, Sep. 14, 1976, abandoned. This application Aug. 10, 1977, Ser. No. 823,257
Int. Cl.[2] C07D 493/04
U.S. Cl. 260—343.21 3 Claims

1. A compound of the formula



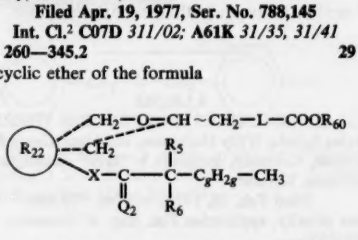
wherein R_2 is selected from the group consisting of hydrogen, lower alkyl or a substituent selected from the group consisting of phenyl, pyridyl, furyl, halo-substituted phenyl, lower alkyl-substituted phenyl, benzyl and alkoxy, halo, nitro or alkyl substituted benzyl.

4,130,569
9-DEOXY-6,9-EPOXYMETHANO-PROSTAGLANDIN DERIVATIVES

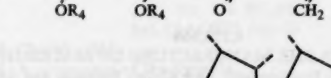
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 19, 1977, Ser. No. 788,145
Int. Cl.[2] C07D 311/02; A61K 31/35, 31/41
U.S. Cl. 260—345.2 29 Claims

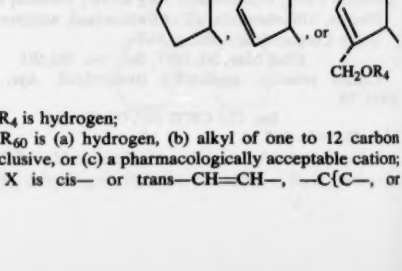
1. A cyclic ether of the formula



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6— and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; wherein L is (1) a valence bond, (2) —$(CH_2)_d$— wherein d is one to 5 inclusive, (3) —$(CH_2)_t$—CF_2— wherein t is 2,3 or 4, (4)—CH_2—(CH=CH—A— wherein A is a valence bond or —$(CH_2)_h$— wherein h is one, 2, or 3, or (5) —CH_2—O—CH_2—Y— wherein Y is a valence bond or —$(CH_2)_k$— wherein K is one or 2; wherein Q_2 is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein R_4 is hydrogen; wherein R_{22} is



wherein R_4 is hydrogen;
wherein R_{60} is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, or (c) a pharmacologically acceptable cation; wherein X is cis— or trans—CH=CH—, —C{C—, or

$-CH_2CH_2-$; and wherein ~ indicates attachment in alpha or beta configuration; including the lower alkanoates thereof.

4,130,570

METHOD OF PRODUCING ETHYLENE OXIDE

Georgy K. Boreskov, Zolotodolinskaya ulitsa, 85; Mikhail G. Slinko, ulitsa Voevodskogo, 2, both of Novosibirsk; Anatoly I. Gelbshtein, ulitsa Fersmana, 11, kv. 76, Moscow; Lidia A. Vasilevich, 2 Sovetskaya ulitsa, 6, kv. 27, Moscow; Boris B. Chesnokov, Malaya Filevskaya ulitsa, 16, kv. 54, Moscow; Irina T. Frolkina, Khokhovsky pereulok, 11, kv. 40, Moscow; Oskar N. Dyment, 6 Parkovaya ulitsa, 12/1, kv. 70, Moscow; Jury N. Stepanov, shosse Entuziastov, 192, kv. 33, Moscow; Valery A. Davydov, Nalesny pereulok, 15/7, kv. 3, Moscow; Irina G. Talaeva, ulitsa Partizanskaya, 18, korpus 2, kv. 3, Moscow; Ninel S. Utkina, ulitsa Izumrudnaya, 32, kv. 23, Moscow; Vera V. Stroganova, ulitsa Karla Marxa, 34, Ljubertsy Moskovskoi oblasti; Maria S. Aksenova, ulitsa Gerasima Kurina, 8, korpus 2, kv. 53, Moscow, all of U.S.S.R.; Anna G. Filippova, deceased, late of Moscow, U.S.S.R.; by Olga B. Prosvirova, administrator, Uralskaya ulitsa, 17, kv. 169, and by Irina B. Zakharova, administrator, 11 Parkovaya ulitsa, 44, korpus 3, kv. 123, both of Moscow, U.S.S.R.

Continuation of Ser. No. 407,837, Oct. 19, 1973, abandoned.
This application Sep. 16, 1975, Ser. No. 613,806
Int. Cl.[2] C07D *301/22*
U.S. Cl. 260—348.35 **17 Claims**

1. A method of producing ethylene oxide with an oxidizing agent selected from the group consisting of molecular oxygen and air, in a reactor having a fluidized bed of a silver catalyst therein consisting essentially of from 9.5 to 19 wt. % of metallic silver; from 0.5 to 1 wt. % of a cadmium compound selected from the group consisting of cadmium carbonate, cadmium oxide, and mixtures thereof, said wt. % of both the silver and cadmium components being based on continuously reacting ethylene on a single pass-recycle basis with said oxidizing agent at a temperature of from 200° to 300° C. at a partial pressure of oxygen of from 0.1 to 2 atm., and at a partial pressure of ethylene of from 0.6 to 15 atm., and an aggregate pressure of from 2 to 20 atm., said catalyst being prepared by precipitating carbonate salts of silver and cadmium; impregnating same into a porous fused alumina carrier having a particle size of from 0.1 to 0.5 mm with a porosity of from 25 to 45 vol. % and a specific surface area of from 0.2 to 0.8 M^2/gm in an 20–70% aqueous solution of ethylene glycol while gradually increasing the temperature up to between 60° and 100° C.; and drying said impregnated alumina carrier with heating at a temperature of from 120° to 150° C., the silver component of said catalyst being reduced to metallic silver during the impregnating and drying steps.

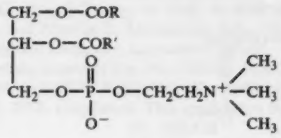
4,130,571

PROCESS FOR PREPARING 1,2-DIACYL-3-GLYCERYLPHOSPHORYLCHOLINES

Tadashi Nakajima, Takatsuki; Yasuji Soda, Kobe; Kenichi Kashima, Fujiidera; Haruyoshi Kudoh, Ibaraki, and Akira Miyamoto, Nishinomiya, all of Japan, assignors to Nippon Shoji Kaisha, Ltd., Osaka, Japan

Filed Jan. 26, 1976, Ser. No. 652,319
Claims priority, application Japan, Feb. 4, 1975, 50-15143
Int. Cl.[2] A23J *7/00*
U.S. Cl. 260—403 **23 Claims**

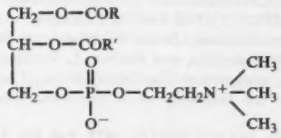
1. A process for preparing a 1,2-diacyl-3-glycerylphosphorylcholine of the formula:



(I)

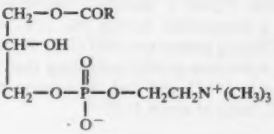
wherein R and R′ are the same and are each a residue of a saturated fatty acid having 10 to 22 carbon atoms or an unsaturated fatty acid having 14 to 20 carbon atoms, which comprises acylating glyceryl-phosphorylcholine or a cadmium chloride salt thereof with an acylating agent selected from the group consisting of 1-acylimidazole and 4-acyl-3-phenyl-1,2,4-oxadiazol-5-one in the presence of a catalyst selected from the group consisting of an alkali salt of a nitrogen-containing 5-membered heterocyclic compound and sodium oxide in anhydrous tetrahydrofuran.

6. A process for preparing a 1,2-diacyl-3-glycerylphosphorylchlorine of the formula:



(I)

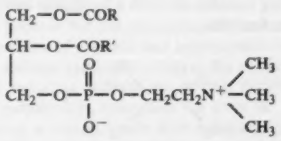
wherein R and R′ are different from each other and are each a residue of a saturated fatty acid having 10 to 22 carbon atoms or an unsaturated fatty acid having 14 to 20 carbon atoms, which comprises acylating a 1-monoacyl-3-glycerylphosphorylcholine of the formula:



(III)

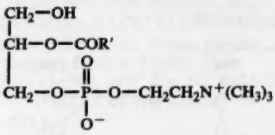
wherein R is a residue of a saturated fatty acid having 10 to 22 carbon atoms or an unsaturated fatty acid having 14 to 20 carbon atoms or a cadmium chloride salt thereof with an acylating agent selected from the group consisting of 1-acylimidazole and 4-acyl-3-phenyl-1,2,4-oxadiozol-5-one wherein the acyl group is a residue of a saturated fatty acid having 10 to 22 carbon atoms or an unsaturated fatty acid having 14 to 20 carbon atoms in the presence of imidazole sodium salt in anhydrous tetrahydrofuran at room temperature.

15. A process for preparing a 1,2-diacyl-3-glycerylphosphorylcholine of the formula:



(I)

wherein R and R′ are different from each other and are each a residue of a saturated fatty acid having 10 to 22 carbon atoms or an unsaturated fatty acid having 14 to 20 carbon atoms, which comprises acylating a 2-monoacyl-3-gylcerylphosphorylchlorine of the formula:



wherein R' is a residue of a saturated fatty acid having 10 to 22 carbon atoms or an unsaturated fatty acid having 14 to 20 carbon atoms or a cadmium chloride salt thereof with an acylating agent selected from the group consisting of 1-acylimidazole and 4-acyl-3-phenyl-1,2,4-oxadiazol-5-one wherein the acyl group is a residue of a saturated fatty acid having 10 to 22 carbon atoms or an unsaturated fatty acid having 14 to 20 carbon atoms in the presence of imidazole sodium salt in anhydrous tetrahydrofuran at room temperature.

4,130,572
PHYSIOCHEMICALLY DESIGNED FAT COMPOSITIONS FROM TALLOW

Francis E. Luddy, Hatboro; James W. Hampson; Samuel F. Herb, both of Philadelphia, and Herbert L. Rothbart, Flourtown, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 642,837, Dec. 22, 1975, Pat. No. 4,049,839, which is a division of Ser. No. 337,789, Mar. 5, 1973, Pat. No. 3,944,585. This application Aug. 18, 1977, Ser. No. 825,742

Int. Cl.[2] A23D *5/00*

U.S. Cl. 260—410.7 **1 Claim**

1. A liquid tallow fraction useful as a base material in the production of salad oils, margarines, shortenings, and synthetic sperm oil consisting essentially of monosaturated, triunsaturated glycerides having a gas-liquid chromatographic profile indicating a composition having 5%, 22%, 44% and 29% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating that it is not completely solid at −15° C. and that the portion that does solidify at −15° C. melts at about 5° C.

4,130,573
PROCESS FOR MAKING ORGANOTIN DIHALIDES AND TRIHALIDES

Ronald E. Hutton, Southport, and Joseph W. Burley, Wallasey, both of England, assignors to Akzo N.V., Arnhem, Netherlands

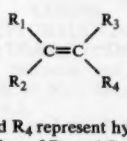
Division of Ser. No. 660,631, Feb. 23, 1976, Pat. No. 4,080,363. This application Apr. 28, 1977, Ser. No. 791,775

Claims priority, application Netherlands, Mar. 17, 1975, 7503116

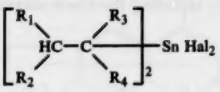
Int. Cl.[2] C07F *7/22*

U.S. Cl. 260—429.7 **5 Claims**

1. A process for the preparation of organotin halides which comprises reacting metallic tin with a hydrogen halide and an olefin having the formula



wherein R_1, R_2, R_3 and R_4 represent hydrogen or a hydrocarbon group, provided that of R_1 and R_2 at least one is an oxygen-containing group with a carbonyl group adjacent to the olefinic double bond to form an organotin dihalide having the formula



4,130,574
METHOD FOR INCREASING THE HYDROGEN:CARBON RATIO OF AN ORGANIC COMPOUND

James L. Fry, Toledo, Ohio, assignor to University of Toledo, Toledo, Ohio

Filed Aug. 1, 1977, Ser. No. 820,734

Int. Cl.[2] C07C *1/22, 29/14, 121/75*

U.S. Cl. 260—465 F **3 Claims**

1. A method for increasing the hydrogen to carbon ratio of an organic compound having at least one hydroxyl, carbonyl, epoxide, acetal, ketal, hemiacetal or hemiketal function, said method comprising introducing the organic compounds and a silicon hydride into a liquid which is either chemically inert or acidic and introducing BF_3 into the liquid to produce a reaction product having a higher hydrogen to carbon ratio than the starting organic compound.

4,130,575
PROCESS FOR PREPARING METHANE RICH GASES

Ernst Jørn, Lyngby, Denmark, assignor to Haldor Topsøe A-S, Søborg, Denmark

Filed Oct. 22, 1975, Ser. No. 624,818

Claims priority, application United Kingdom, Nov. 6, 1974, 47924/74; Apr. 22, 1975, 16641/75

Int. Cl.[2] C07C *1/04*

U.S. Cl. 260—449 M **3 Claims**

1. In a process for producing a methane rich gas in at least one adiabatically operated methanation reactor in which process an inlet stream of a preheated methane synthesis gas containing 40–80% hydrogen, 0–35% carbon dioxide and 10–50% carbon monoxide is combined with a recycle stream of product gas from the methanation reactor to form a combined stream which thereafter is passed through a bed of a methanation catalyst contained in the methanation reactor, the outlet stream from the methanation reactor being divided into the recycle stream and a stream of product gas to be passed on, the improvement which comprises the steps of:

(a) in forming the combined stream, the ratio of the recycle stream to the inlet stream being selected within a range of from 1:1 to 5:1 to provide in the combined stream such contents of hydrogen and carbon oxides which upon methanation to equilibrium produce sufficient heat to raise the temperature of the outlet stream leaving the methanation reactor to a temperature of between 500° C. and 700° C.,

(b) cooling the outlet stream from the temperature of between 500° C. and 700° C. to a temperature of between 250° C. and 350° C. and being at least 50° C. above the dew point of the outlet stream at its actual pressure and composition, and

(c) after the cooling in step (b) and substantially at the temperature obtained therein, withdrawing the recycle stream from the outlet stream by means of an ejector and without further treatment combining it with the inlet stream.

4,130,576

METHOD FOR PREPARING ISOCYANATES FROM HALOSILYL CARBAMATES

Eddie Hedaya, White Plains, and Theodoropulos Spyros, Yorktown Heights, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 687,160, May 17, 1976, Pat. No. 4,064,151. This application Dec. 19, 1977, Ser. No. 862,208
Int. Cl.[2] C07C *118/00*
U.S. Cl. 260—453 P 14 Claims

1. A process of preparing isocyanates in a liquid phase reaction from primary amines which comprises reacting a primary amine with carbon dioxide to form the corresponding carbamic acid salt, reacting the carbamic acid salt to form a halosilyl carbamate having the formula:

$$RNHCOOSiXY_2$$

wherin R is the organic moiety of the primary amine, X is halogen and Y is a member selected from the group consisting of halogen, hydrogen, lower alkyl, alicyclics, aryl, alkaryl and aralkyl, each having no more than about 10 carbon atoms, and heating the halosilyl carbamate to a temperature and for a time sufficient to yield the isocyanate.

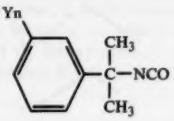
4,130,577

PROCESS FOR PREPARING α, α-DIMETHYLBENZYL ISOCYANATES

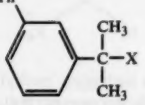
Nobuyuki Nagato, Wako, and Taketoshi Naito, Yokohama, both of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,815
Claims priority, application Japan, Oct. 25, 1976, 51-127168
Int. Cl.[2] C07C *118/00*
U.S. Cl. 260—453 P 9 Claims

1. A process for preparing α,α-dimethylbenzyl isocyanate or its ring-substituted derivatives of the formula



wherein Y is a halogen atom or an alkyl, haloalkyl or alkoxy group each having 1 to 4 carbon atoms and n is an integer of 0, 1 or 2,
which comprises reacting an α,α-dimethylbenzyl halide or its ring-substituted derivative of the formula



(1)

wherein X is chlorine or bromine, and Y and n are as defined above,
with an alkali metal cyanate in an organic solvent in a substantially anhydrous condition at a temperature of between 0° C. and 150° C. in the presence of, as a catalyst, at least one member selected from the group consisting of metallic V, Mn, Co, Zn, Pd and Sn and oxides and mineral acid salts or carboxylic acid salts of these metals, said organic solvent being an aprotic solvent which forms no salt or adduct with a hydrogen halide.

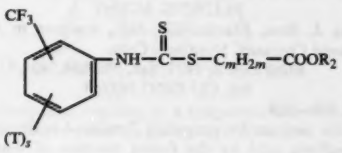
4,130,578

IMMUNOSUPPRESSIVE DITHIOCARBANILATES

Hewitt G. Wight; Tracey G. Call, both of San Luis Obispo, Calif., and Marvin L. Mortensen, Kila, Mont., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 773,064, Feb. 28, 1977, Pat. No. 4,110,444, which is a continuation-in-part of Ser. No. 579,449, May 21, 1975, abandoned. This application Nov. 4, 1977, Ser. No. 848,433
Int. Cl.[2] C07C *153/09*
U.S. Cl. 260—455 A 6 Claims

1. A compound of the formula



wherein T is nitro, fluoro, chloro, bromo, trifluoromethyl, lower alkylsulphonyl, phenylsulphonyl, or (lower alkyl)-phenylsulphonyl;
wherein s is the integer 0 or 1;
wherein C_mH_{2m} is alkylene of 1 to 5 carbon atoms, inclusive; and
wherein R_2 is alkyl of 1 to 12 carbon atoms, inclusive.

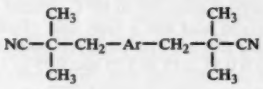
4,130,579

BIS(2-METHYL-2-CYANOPROPYL) AROMATICS

August H. Frazer; John F. Harris, Jr., and Elmore L. Martin, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 8, 1977, Ser. No. 804,855
Int. Cl.[2] C07C *121/66*
U.S. Cl. 260—465 H 6 Claims

1. Aromatic-aliphatic dinitriles of the formula



in which Ar is an arylene selected from the group consisting of 1,2-phenylenes, 1,3-phenylenes, 1,4-phenylenes, 2,2′-biphenylenes, 3,3′-biphenylenes, 4,4′-biphenylenes, 4,4′-phenyleneoxyphenylenes, 4,4′-phenylenemethylenephenylenes and 2,6-naphthylenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl.

4,130,580

SODIUM ION REMOVAL FROM ACETONE CYANOHYDRIN

Michael Cholod, Cornwells Heights, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 3, 1977, Ser. No. 848,166
Int. Cl.[2] C07C *121/36*
U.S. Cl. 260—465.6 4 Claims

1. In a process for the preparation of acetone cyanohydrin by the reaction of acetone and hydrocyanic acid in the presence of a sodium hydroxide catalyst, the method of removal of corrosion inducing sodium ion during purification of crude acetone cyanohydrin, comprises the steps of

(a) passing a cooled, crude acetone cyanohydrin feedstream through a cationic ion exchange resin in the acid form to remove substantially all of said sodium ion;
(b) regenerating exhausted ion exchange resin;
(c) acidifying said substantially sodium ion-free crude feedstream to a pH of 1.5–2.0 to stabilize said crude acetone cyanohydrin;

(d) feeding said acidified substantially sodium ion-free crude feedstream to a first concentrator;
(e) removing overhead from said first concentrator unreacted acetone and sending the bottoms from said first concentrator to a second concentrator; and
(f) removing purified acetone cyanohydrin as bottoms from said second concentrator and recycling the overhead from said second concentrator for further generation of acetone cyanohydrin.

4,130,581

PREPARING J ACID BY FUSION USING PHENOLIC FLUXING AGENT

Lawrence J. Ross, Martinsville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 3, 1977, Ser. No. 838,780
Int. Cl.[2] C07C *143/66*
U.S. Cl. 260—509 **4 Claims**

1. In the process for preparing 7-amino-4-hydroxy-2-naphthalenesulfonic acid by the fusion reaction of 6-amino-1,3-naphthalenedisulfonic acid with a caustic alkali at an elevated temperature followed by cooling and neutralization with an acid, the improvement which comprises providing an effective amount of a phenolic compound selected from the group consisting of phenol, cresol and alkali metal salts thereof as a fluxing agent to the reaction mixture.

4,130,582

PREPARATION OF PHENOLIC ETHYLENEDIAMINEPOLYCARBOXYLIC ACIDS

Harris E. Petree, Kernersville; Hal L. Myatt, Greensboro, and Alex M. Jelenevsky, Nashville, all of N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 19, 1977, Ser. No. 788,712
Int. Cl.[2] C07C *51/00*
U.S. Cl. 562—448 **4 Claims**

1. A process for the preparation of ethylene-bis(α-iminohydroxyphenylacetic acid) wherein a major portion thereof is an orto isomeric form, said process comprising reacting, at a temperature of from about 45° to 80° C., phenol with ethylenediamine, glyoxylic acid and a base; said phenol, ethylenediamine, glyoxylic acid and base being present in a molar ratio of 3 to 20, 0.5 to b 0.55, 0.95 to 1.25 and 0.75 to 1.25.

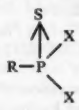
4,130,583

PROCESS FOR PREPARING ALKYL- OR ARYLPHOSPHONOTHIOIC DIHALIDES

Eugene H. Uhing, Ridgewood, N.J., and Arthur D. F. Toy, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 551,805, Feb. 20, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,474
Int. Cl.[2] C07F *9/34, 9/04*
U.S. Cl. 260—543 P **6 Claims**

1. A method of preparing compounds of the formula:



(I)

wherein R is selected from the group consisting of C_1 to C_{20} alkyl; the aryl substituted derivatives thereof; said aryl having 1 or 2 fused rings, cycloalkyl of 5–6 carbons in the ring; aryl of up to 3 fused rings; biphenyl and the C_1–C_4 alkyl substituted derivatives of said cycloalkyl, aryl and biphenyl and X is chlorine or bromine, comprising contacting under at least an autogenous pressure at a temperature of from about 200° C. to about 400° C. a dialkyl or diaryl thioether reactant of the formula:
wherein R is as defined above, with phosphorus and halogen containing reactants selected from the group consisting of PX_3 and $P(S)X_3$, where X is as defined above; and with reactants selected from the group consisting of P_4S_3, P_4S_5, P_4S_7 *and* P_4S_{10}; and additionally, elemental phosphorus.

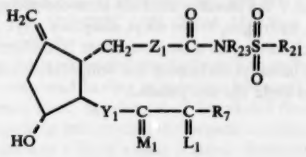
4,130,584

9-DEOXY-9-METHYLENE-PGF SULFONYLAMIDES

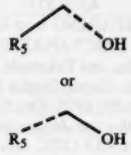
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805. This application Apr. 7, 1978, Ser. No. 894,271
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—556 A **32 Claims**

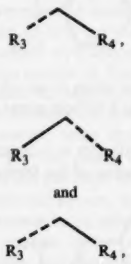
1. A prostaglandin analog of the formula



wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2C-H_2—
wherein M_1 is

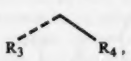


wherein R_5 is hydrogen or methyl;
wherein L_1 is

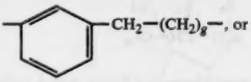


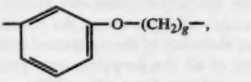
or a mixture of

and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein Z_1 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,

(9)  , or

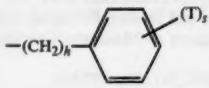
(10)  ,

wherein g is one, 2 or 3;

wherein R_7 is

(1) $-(CH_2)_m-CH_3$,

(2) , or

(3) 

wherein m is one to 5, inclusive, h is zero or one, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2 or 3, the various T's being the same or different, with the proviso that not more then two T's are other than alkyl, with the further proviso that R_7 is

wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different; and

wherein R_{21} is hydrogen, alkyl of one to 12 carbon inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive; and R_{23} is hydrogen or alkyl of one to 4 carbon atoms.

4,130,585

BIS-TRIAMINOGUANIDINE DECAHYDRODECABORATE, PROCESS FOR PREPARATION, AND HIGH ENERGY PROPELLANT

Terrence P. Goddard, Aptos, Calif., assignor to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Filed Jan. 24, 1977, Ser. No. 762,229

Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 D **5 Claims**

1. The triaminoguanidinium salt of decahydrodecaboric acid, having the formula $(C(NHNH_2)_3)_2\ B_{10}H_{10}$.

4,130,586

PROCESS FOR PRODUCING IMINE COMPOUNDS

Tomiya Isshiki; Tetsuo Tomita; Mitsuo Abe, all of Tokyo, and Norio Takeda, Matsudo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

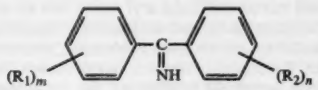
Filed Aug. 25, 1977, Ser. No. 827,791

Claims priority, application Japan, Sep. 14, 1976, 51-110448

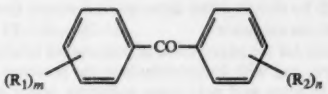
Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 R **8 Claims**

1. A process for producing an imine compound represented by the general formula:

(I) 

which comprises reacting, at a temperature of 50°–350° C., a compound represented by the general formula:

(II) 

wherein R_1 and R_2 represent hydrogen atoms, halogen atoms and alkyl, alkoxy and nitro groups, and R_1 and R_2 may be the same or different from each other, and m and n are integers of 1 to 5, with ammonia at a pressure of 1–50 atmospheres in the presence of 0.01–10% by wt. based on compound II of a carboxylic acid from the group consisting of formic acid, acetic acid, propionic acid, butyric acid, isobutyric acid, valeric acid, pivalic acid, caproic acid, ethanic acid, caprylic acid, pelargonic acid, capric acid, undecanoic acid, lauric acid, dodecanoic acid, myristic acid, palmitic acid, stearic acid, chloracetic acid, bromacetic acid, fluoracetic acid, trichloracetic acid, trifluoracetic acid, glycollic acid, lactic acid, thioglycollic acid, acrylic acid, phenylacetic acid, α-naphthylacetic acid, oxalic acid, malonic acid, succinic acid, adipic acid, maleic acid, malic acid, citric acid, azelaic acid, phthalic acid, isophthalic acid, terephthalic acid, trimellitic acid, trimesic acid, nicotic acid, isonicotic acid, benzoic acid, tolylic acid, chlorobenzoic acid, nitrobenzoic acid, salicylic acid, anthranilic acid, lutidinic acid, glycine, alanine, methionine or leucine.

4,130,587

SUBSTITUTED NORBORNANE DERIVATIVES

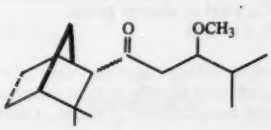
Kenneth K. Light, Long Branch; James M. Sanders, Eatontown; Manfred H. Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, NJ; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middleton, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853. This application Dec. 13, 1977, Ser. No. 860,136

Int. Cl.² C07C *49/61, 49/42*

U.S. Cl. 260—586 G **3 Claims**

1. The compound having the structure:



wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond.

4,130,588

PROCESS FOR PRODUCING METHYLENE DIANILINE

Alton E. Martin; Warren D. White, and Samuel L. Smolik, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 2, 1977, Ser. No. 764,671
Int. Cl.[2] C07C *85/26*
U.S. Cl. 260—570 D **10 Claims**

1. In a process for the preparation of polyamines wherein an aryl amine is reacted with formaldehyde in the presence of an acid catalyst to form said polyamine, sufficient water is employed to cause separation of the reactant mixture during extraction of said mixture with the aryl amine into an organic phase and an aqueous phase and subsequently returning the aqueous phase to the reactor and recovering the resultant polyamine from the organic phase by known means, the improvement which comprises conducting the extraction at a temperature of from about 10° C. to about 50° C. and

conducting the extraction in the presence of a water soluble inorganic salt which is non-reactive with any of the components of the process in quantities of from about 1% to about 25% by weight based upon the feed stream from the reactor to the extractor.

6. In a process for the preparation of polyamines wherein an aryl amine is reacted with formaldehyde in the presence of an acid catalyst to form said polyamine sufficient water is employed to cause separation of the reactant mixture during extraction of said mixture with the aryl amine into an organic phase and an aqueous phase and subsequently returning the aqueous phase to the reactor and recovering the resultant polyamine from the organic phase by known means, the improvement which comprises conducting the extraction in a single unit multi-stage extraction vessel at a temperature of from about 10° C. to about 50° C. employing a dual solvent system wherein one solvent is the aryl amine and the other is water, and

conducting the extraction in the presence of a water soluble inorganic salt which is non-reactive with any of the components of the process in quantities of from about 1% to about 25% by weight based upon the feed stream from the reactor to the extractor.

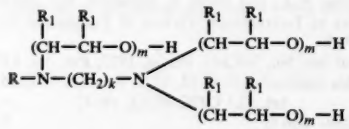
4,130,589

OXYALKYLATED ALKYL POLYAMINES AS DEFOAMING AGENTS

Guido Grassi, Basel; Hans-Peter Baumann, Ettingen, and Helmut Pummer, Therwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 745,307, Nov. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 637,717, Dec. 4, 1975, abandoned. This application Feb. 14, 1978, Ser. No. 877,579
Int. Cl.[2] C07C *93/04*
U.S. Cl. 260—584 B **15 Claims**

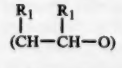
1. A compound of the formula



wherein

R is a C_{10}–C_{30} alkyl or alkenyl group,

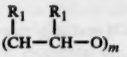
one of the R_1's in each



unit is hydrogen and the other is hydrogen or methyl,

k is an integer 2 to 8,

and each m is, independently, an integer 2 to 221, each



chain consists of a polyethylene-oxy block and a polypropylene-oxy block, wherein the polyethylene-oxy blocks are attached directly to the amino nitrogen atoms, the number of all ethylene-oxy groups per molecule of the compound being from 5 to 35 and the number of all the propylene-oxy groups per molecule of the compound being from 170 to 190,

which compound is in free base, acid addition salt and/or quaternary ammonium salt form.

4,130,590

PRODUCTION OF UNSATURATED AMINES

Charles F. Hobbs, Des Peres, and Dudley E. McMackins, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 21, 1976, Ser. No. 697,900
Int. Cl.[2] C07C *85/18*
U.S. Cl. 260—585 D **27 Claims**

1. The process of producing N-(alkadienyl)amines at a rapid rate and in high yield by reaction of conjugated dienes and ammonia or amines having from one to about 20 carbon atoms in a hydroxylic solvent medium in the presence of a catalyst comprising a palladium compound co-catalyzed with a phosphonite ligand.

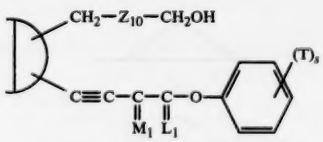
4,130,591

2-DECARBOXY-2-HYDROXY-METHYL-13,14-DIDEHYDRO-16-PHENOXY PGF COMPOUNDS

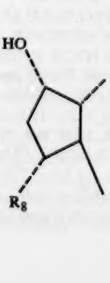
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 814,410, Jul. 11, 1977, which is a division of Ser. No. 708,752, Jul. 26, 1976, Pat. No. 4,058,564. This application Feb. 24, 1978, Ser. No. 880,742
Int. Cl.[2] C07C *177/00*
U.S. Cl. 568—645 **66 Claims**

1. A prostaglandin analog of the formula

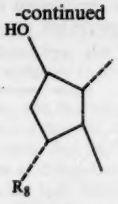


wherein is



or

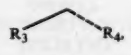
-continued



wherein R_8 is hydrogen or hydroxy;
wherein M_1 is

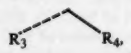
or

wherein R_5 is hydrogen or methyl;
wherein L_1 is



of a mixture of

and



wherein R_3 and R_4 are hydrogen or methyl being the same or different;

wherein Z_{10} is

(1) cis-CH=CH-CH-$(CH_2)_g$-CH_2—,
(2) cis-CH=CH-CH_2-$(CH_2)_g$-CF_2—,
(3) cis-CH_2-CH=CH-$(CH_2)_g$-CH_2—,
(4) —$(CH_2)_3$-$(CH_2)_g$-CH_2,
(5) —$(CH_2)_3$-$(CH_2)_g$-CF_2—, or
(6) —CH_2-O-CH_2-$(CH_2)_g$-CH_2—,

wherein g is one, 2, or 3; and

wherein s is one to 3, inclusive and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two are other than alkyl, with the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different.

4,130,592

METHOD FOR THE PREPARATION OF CHLOROACETALDEHYDEDIMETHYL ACETAL

Wilhelm Vogt, Koeln-Suelz, and Herman Richtzenhain, Post Marialinden, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf Bez. Koeln, Germany

Continuation of Ser. No. 182,861, Sep. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 169,494, Aug. 5, 1971, Pat. No. 3,784,612, which is a continuation-in-part of Ser. No. 774,216, Nov. 7, 1968, abandoned. This application Feb. 27, 1973, Ser. No. 336,286

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1967, 1643899; Mar. 16, 1968, 1693017

Int. Cl.[2] C07C *41/00, 43/30, 41/10*

U.S. Cl. 568—604 **8 Claims**

1. In the process of producing chloroacetaldehydedimethylacetal and 2,2-dichloroethylmethylether which comprises reacting vinyl chloride with chlorine and methanol at a temperature between −20 ° C. and 100° C., the improvement which comprises carrying out the reaction in the presence of a stoichiometric amount, based on the amount of HCl formed in the process, of an HCl acid binding material selected from the group consisting of aliphatic 1,2-epoxides, hydroxides, oxides, carbonates and alcoholates, of elements of the first and second sub-group of the Periodic Table, ammonia, amines and basic ion exchange resins, said methanol containing less than 2% by weight water, and being present in a molar excess with respect to said chlorine and neutralizing the reaction mixture by addition of an acid binding material.

4,130,593

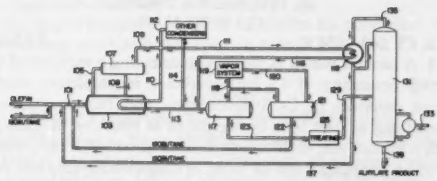
ALKYLATION PROCESS UTILIZING THE HYDROCARBON PHASE FROM A REACTOR FOR CONDENSING A VAPOROUS DISTILLATION EFFLUENT

Richard H. Jones, South Euclid, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 650,341, Jan. 19, 1976, abandoned. This application Nov. 18, 1976, Ser. No. 742,949

Int. Cl.[2] C07C *23/02*

U.S. Cl. 260—683.48 **37 Claims**



12. In a continuous process for producing alkylate in which olefin and a molar excess of isobutane are reacted together in an alkylation zone in the presence of an acid catalyst to form a liquid reaction effluent, said liquid reaction effluent is separated into an acid catalyst phase and a hydrocarbon mixture, and said hydrocarbon mixture is subjected to fractionation to recover alkylate therefrom, said fractionation including separating said hydrocarbon mixture to form a vaporous fraction and thereafter condensing said vaporous fraction by cooling, the improvement wherein said vaporous fraction is cooled by passing a portion of said hydrocarbon mixture from said alkylation zone in indirect heat exchange with said vaporous fraction.

4,130,594

LIQUID PHASE FLUORINATION PROCESS

Lawrence P. Sendlak, Tonawanda, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 829,847, Sep. 1, 1977. This application Mar. 20, 1978, Ser. No. 888,588

Int. Cl.[2] C07C *25/04*

U.S. Cl. 260—651 F **22 Claims**

1. A process for the preparation of compounds of the formula

$$R_nAr(CF_{w'}X_{p'})_Z$$

comprising contacting compounds of the formula

$$R_nAr(CF_wX_p)_Z$$

in liquid phase, with hydrogen fluoride in the presence of a molybdenum halide catalyst selected from the group consisting of $MoCl_3$, $MoCl_4$, $MoOCl_4$, MoO_2Cl_2 and MoF_6

wherein

Ar is aryl;

R is a substituent on the aryl nucleus selected from the group

consisting of aryl, substituted aryl, halogen, alkyl, alkoxy, and substituted alkyl;
n is 0 to 9;
X is a halogen atom other than fluorine;
w is 0 to 2;
p is 1 to 3;
w' is 1 to 3, and is greater than w;
p' is 0 to 2, and is less than p
w + p is 3;
w' + p' is 3;
Z is 1–10; and
the maximum value of n + Z is 10.

4,130,595

MELT OXYCHLORINATION PROCESS

Harold E. Bellis, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 547,017, Feb. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 206,157, Dec. 8, 1971, abandoned, and Ser. No. 764,649, Oct. 2, 1968, and Ser. No. 740,762, Jun. 27, 1968, Pat. No. 3,583,949. This application Aug. 20, 1976, Ser. No. 716,292

Int. Cl.[2] C07C *21/00*

U.S. Cl. 260—654 R **5 Claims**

1. A process which comprises chlorinating a material of the group consisting of C_2 hydrocarbons, incompletely chlorinated derivates of C_2 hydrocarbons, and mixtures thereof, containing at least 50% by weight of at least one of 1,1,2-trichloroethane and dichloroethylene to produce a chlorinated product containing one or more of trichloroethylene and perchloroethylene, at a temperature within the range of 300°–500° C., by means of a melt consisting essentially of iron chloride, copper chloride and alkali metal chloride by dispersing the material to be chlorinated in the melt whereby said material is chlorinated by the melt; withdrawing a gaseous effluent from the reaction zone which contains unreacted starting material and the resulting chlorinated hydrocarbon products and recovering the chlorinated hydrocarbon products from the effluent as the product of the process wherein:

(a) the alkali metal chloride is selected from the group consisting of sodium chloride, potassium chloride, rubidium chloride, cesium chloride, and mixtures thereof;

(b) the mole ratio of iron chloride to copper chloride is from about 0.1:1 to about 2:1,

(c) the mole ratio of alkali metal chloride to combined moles of iron and copper chlorides is from about 0.5:1 to about 2:1; and

(d) at least some of the copper chloride is cupric chloride and substantially all of the iron chloride is ferric chloride.

4,130,596

PROCESS FOR PRODUCING CHLOROPRENE MONOMER HAVING A LITTLE CONTENT OF ACETALDEHYDE

Takashi Kadowaki; Michio Nishimura; Seiichi Watanabe, and Koichi Abe, all of Ohmi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

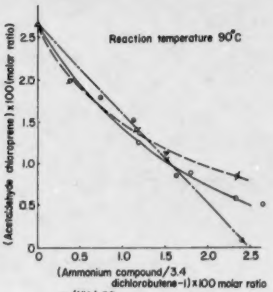
Continuation of Ser. No. 21,740, Mar. 23, 1970, abandoned. This application Jan. 22, 1975, Ser. No. 543,107

Claims priority, application Japan, Mar. 24, 1969, 44-21900; Apr. 21, 1969, 44-30375

Int. Cl.[2] C07C *21/20*

U.S. Cl. 260—655 **12 Claims**

1. A method for producing chloroprene which comprises: dehydrochlorinating 3,4-dichlorobutene-1 with an aqueous solution of an alkali metal hydroxide in the presence of an ammonium ion donor chosen from the group consisting of ammonium acetate, ammonium nitrate and ammonium sulfate, said ammonium ion donor being present in an



amount of from 0.5 mol % to 2.5 mol % based on 3,4-dichlorobutene-1.

4,130,597

DEHYDROGENATION USING MULTIMETALLIC CATALYST

Frederick C. Wilhelm, 1600 Huron Pkwy., P.O. Box 1568, Ann Arbor, Mich. 48106

Division of Ser. No. 597,626, Jul. 21, 1975, which is a continuation-in-part of Ser. No. 479,231, Jun. 13, 1974, Pat. No. 3,915,846, which is a continuation-in-part of Ser. No. 353,925, Apr. 23, 1973, Pat. No. 3,839,195, which is a continuation-in-part of Ser. No. 152,467, May 28, 1971, abandoned, which is a division of Ser. No. 835,218, Jun. 20, 1969, abandoned. This application Jul. 21, 1977, Ser. No. 817,769

Int. Cl.[2] C07C *5/36*

U.S. Cl. 260—666 A **29 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a non-acidic catalytic composite consisting essentially of a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, and lead in an amount sufficient to result in an atomic ratio of lead to platinum or palladium of about 0.05:1 to about 0.9:1, wherein substantially all of the platinum or palladium, rhodium, and lead are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and rhodium are present in the elemental metallic state, and wherein substantially all of the lead is present in an oxidation state above that of the elemental metal.

4,130,598

2,5-DIMETHYL-2,4-HEXADIENE PRODUCTION

Warren Hewertson; David Holland, and David J. Milner, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 2, 1976, Ser. No. 702,130

Claims priority, application United Kingdom, Jul. 2, 1975, 27923/75

Int. Cl.[2] C07C *11/12*

U.S. Cl. 260—680 R **5 Claims**

1. A process for the production of 2,5-dimethyl-2,4-hexadiene which comprises (1) dehydrodimerizing isobutene by heating it at a temperature in the range of 200°–600° C. and in the vapour phase in the presence of a peroxide which is a free-radical generator and a 1,1,2-trihaloethylene to produce 2,5-dimethyl-1,5-hexadiene; (2) isomerizing the 2,5-dimethyl-1,5-hexadiene to the conjugated 2,5-dimethyl-2,4-hexadiene prior to isolation of the 2,5-dimethyl-1,5-hexadiene, by heating the latter at a temperature in the range 100° to 170° C. in the presence of p-toluene sulphonic acid and (3) subsequently isolating the said conjugated isomer.

4,130,599
SILANOL-FREE RESINS

Duane F. Merrill, Ballston Spa, and Richard C. Cooke, Jr., Elnora, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 578,983, May 19, 1975, abandoned, which is a continuation of Ser. No. 231,403, Mar. 2, 1972, abandoned. This application Jun. 16, 1976, Ser. No. 696,663
The portion of the term of this patent subsequent to Sep. 18, 1990, has been disclaimed.
Int. Cl.[2] C08L *43/04*
U.S. Cl. 260—825 **10 Claims**

1. A silicone molding composition with improved thermal shock resistance having therein a base silicone resin having $R^1SiO_{3/2}$ unit and $R_2{}^1SiO$ units where R^1 is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, a filler and comprising the improvement in which there is present a plasticizing amount of a low-silanol content silicone resin having less than 0.5 weight silanol groups and an R to Si ratio that varies from 1.0:1 to 1.9:1 that is produced by the process comprising (a) adding a mixture of hydrolyzable silanes of the formula,

$$R_aSiX_{4-a}$$

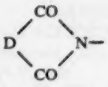
to water where there is present at least 2 parts of water per part of said silanes and 1 to 5 parts of a water-immiscible organic solvent per part of said silanes at a temperature range of 25° C. to 85° C. and where the silanes are added to said water slowly so as to form a hydrolyzate; (b) continually agitating said mixture; (c) separating the organic layer and adjusting it to 10–40% solids; (d) within 24 hours from the formation of said hydrolyzate catalyzing said organic layer with 300–600 ppm of an alkali metal hydroxide per part of solid, and refluxing the resulting mixture at 100°–160° C.; (e) neutralizing the alkali metal hydroxide in the refluxed mixture with acetic acid; and (f) stripping from the organic layer excess acetic acid and solvent, where R is selected from the group consisting of alkyl radicals of 1 to 8 carbon atoms, cycloalkyl radicals of 5 to 7 carbon atoms, alkenyl radicals of 2 to 8 carbon atoms, mononuclear aryl radicals, mononuclear aryl lower alkyl radicals where the alkyl portion is 1 to 6 carbon atoms and halogenated derivatives of the above radicals, where X is a chlorine radical and a is a whole number that varies from 1 to 2 and such that 40 mole percent to 60 mole percent of the R radicals are selected from the class consisting of mononuclear aryl radicals and mononuclear aryl lower radicals and halogenated derivatives of the foregoing radicals.

4,130,600
EPOXIDE RESIN MIXTURES

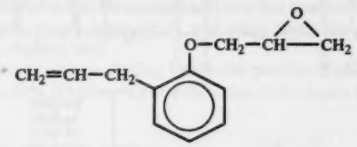
Abdul-Cader Zahir, Oberwil, and Siegfried Wyler, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 6, 1977, Ser. No. 803,497
Claims priority, application Switzerland, Jun. 17, 1976, 7747/76
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—830 P **13 Claims**

1. A storage-stable, thermosetting mixture which comprises:
(a) a polyimide containing in the molecule at least two radicals of the general formula


(I)

wherein d represents a bivalent radical containing a carbon-carbon double bond;
(b) 0.05 to 10 moles per equivalent of polyimide of an epoxide compound which contains at least one allyl group selected from the group consisting of
(α) glycidyl ethers of the formula


(II)

(β) glycidyl ethers of novolaks (x) which contain two or more epoxide groups per molecule and are substituted on an aromatic nuclei with at least one allyl group,
(γ) polyepoxy adducts (Y), having two or more epoxy groups per molecule, produced by an advancement reaction of one or more diepoxide compounds with one or more bisphenols, where at least one reactant is substituted on an aromatic nuclei with at least one allyl group,
(δ) epoxide compounds (Z) produced by the reaction of bisphenols, which are substituted on an aromatic nuclei with at least one allyl group, with epichlorohydrin in alkaline solution;
(c) up to 2 moles of a curing agent for epoxide compounds per equivalent of polyimide; and,
(d) up to 3 percent by weight, relative to the polyimide, of a curing accelerator for epoxide resins.

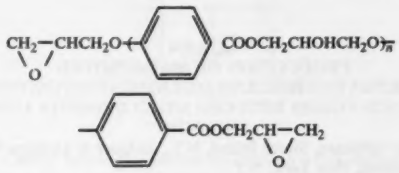
4,130,601
RESIN COMPOSITION FOR POWDER PAINT

Masataka Ohoka, Nara; Mitsuko Yamada, Izumi; Akio Shoji, Osaka, and Shunji Arimoto, Izumi-otsu, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 879,760
Claims priority, application Japan, Mar. 11, 1977, 52-26040
Int. Cl.[2] C08L *63/02*
U.S. Cl. 260—835 **6 Claims**

1. A resin composition for powder paints, said composition comprising (I) 70 to 97% by weight of a polyester resin containing free carboxyl groups in the molecule and having an acid value of 20 to 100 KOH mg/g and a softening point of 70° to 150° C. and (II) 3 to 30% by weight of glycidyl p-glycidyloxybenzoate.

4. The composition of claim 1 wherein the glycidyl p-glycidyloxybenzoate (II) is expressed by the general formula



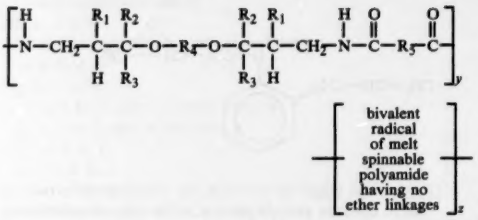
wherein n is 0 or an integer of 1 to 10.

4,130,602
BLOCK COPOLYMER OF POLY(DIOXA-AMIDE) AND POLYAMIDE

Robert M. Thompson, Wilmington, Del., assignor to Sun Ventures, Inc., Radnor, Pa.

Continuation-in-part of Ser. No. 557,717, Mar. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 418,524, Nov. 14, 1973, abandoned. This application Feb. 16, 1977, Ser. No. 769,246
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—857 TW **47 Claims**

1. A block copolymer of poly(dioxa-amide) and polyamide having a molecular weight of about 5000–100,000 and the following repeating structural formula:



wherein

R_1, R_2 and R_3 are selected from the group consisting of H, C_1–C_{10} alkyls and C_3–C_{10} isoalkyls;

R_4 is selected from the group consisting of C_1–C_{10} alkylenes and C_3–C_{10} isoalkylenes;

R_5 is selected from the group consisting of C_0–C_{10} alkylenes and C_3–C_{10} isoalkylenes;

and y = 4–200, z = 4–200.

4,130,603

THERMOPLASTIC LINEAR BLOCK COPOLYETHER-POLYESTERS AS HOT MELT ADHESIVES FOR TEXTILES

Chiaki Tanaka, Chita; Yatabe Yoko, and Morikawa Masanobu, both of Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 4, 1977, Ser. No. 765,608

Int. Cl.² C08L 67/02

U.S. Cl. 260—860 **2 Claims**

1. A dry cleaning resistant hot-melt adhesive for textiles which comprises a thermoplastic linear block copolyether-polyester consisting essentially of a dicarboxylic acid unit derived from 40 to 60 mol % of terephthalic acid and 60 to 40 mol % of isophthalic acid, a diol unit derived from 1,4-butanediol and a polyether unit derived from poly tetramethylene glycol having a molecular weight of about 600 to 1300, wherein the amount of the polyether unit is 10 to 33% by weight on the basis of the block copolyether-polyester and the block copolyether-polyester has a relative viscosity of 1.3 to 1.7 as measured using 0.5 g. of polymer per 100 ml. of orthochlorophenol at 25° C. and a melting point of 95° to 145° C.

4,130,604

PRODUCTION OF AN IMPROVED POLYOXYMETHYLENE MOLDING COMPOSITION WHICH FORMS REDUCED MOLD DEPOSITS UPON MOLDING

Robert Edelman, Staten Island, N.Y., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 751,849, Dec. 17, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,662

Int. Cl.² C08L 69/00

U.S. Cl. 260—860 **25 Claims**

1. A process for producing an improved polyoxymethylene molding composition comprising heating a mixture of:

(1) a polyoxymethylene polymer which exhibits a propensity to form mold deposits upon molding, and

(2) about 1 to about 4 percent by weight based on the weight of the polyoxymethylene polymer of an aromatic polycarbonate having an intrinsic viscosity of about 0.35 to 0.75 in methylene chloride at 25° C. which is derived from a non-hindered non-halogenated dihydric phenol,

for at least about 2 minutes at a temperature at which the polyoxymethylene polymer is molten to yield a molding composition which forms a reduced quantity of mold deposits upon molding.

4,130,605

METHOD FOR REDUCING THE DRIPPING IN FLAMING POLYSTYRENE COMPOSITIONS

Raymond A. Barkhuff, Jr., Hampden, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 26, 1976, Ser. No. 679,942

Int. Cl.² C08L 51/04

U.S. Cl. 260—876 R **18 Claims**

1. A method for reducing the tendency of fire retardant polystyrene to drip under flaming conditions, which method comprises incorporating into the polystyrene composition from 1 to 10 percent by weight, based on the total weight of the polystyrene based composition of a polychloroprene rubber whereby the tendency to drip is reduced.

4,130,606

RUBBER COMPOSITIONS

Hendrik Van Ballegooijen; Frederik L. Binsbergen; Jacob Raadsen, and Arie D. Vreugdenhil, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 701,831, Jul. 1, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 782,209

Claims priority, application United Kingdom, Jul. 9, 1975, 28899/75

Int. Cl.² C08L 9/00

U.S. Cl. 260—894 **10 Claims**

1. A rubbery composition having an intrinsic viscosity of between about 1.3 and 5.0 dl/g prepared by blending together components A and B wherein:

(a) A comprises 40 to 94 percent by weight of the total rubbery composition and component B comprises 60 to 6 percent by weight;

(b) the ratio of the intrinsic viscosity of component A to component B varies from 3.0 to 50.0;

(c) component A is selected from the group consisting of styrene-butadiene copolymers, polybutadiene, polyisoprene, and mixtures thereof produced by solution polymerization employing an alkyl lithium initiation and a coupling agent wherein at least 60 percent by weight of the polymers and copolymers in the A component have a branched structure having at least 20 monomer units per branch, said branched structure having at least three arms; and

(d) component B is selected from the group consisting of styrene-butadiene copolymers, polybutadiene, polyisoprene, and mixtures thereof.

4,130,607

PREPARATION OF DITHIOPHOSPHORIC ACID DIESTER HALIDES

Hermann Arold, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

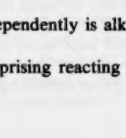
Filed Sep. 2, 1977, Ser. No. 830,381

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642982

Int. Cl.² C07F 9/20

U.S. Cl. 260—973 **10 Claims**

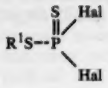
1. A process for the preparation of a dithiophosphoric acid diester halide of the formula



in which

R^1 and R^2 each independently is alkyl with 1 to 5 carbon atoms, and

Hal is halogen, comprising reacting an S-alkyl dihalide of the formula



with an alcohol of the formula

R^2OH

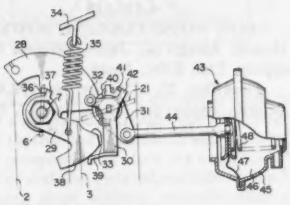
at a temperature of about −5° to −90° C. in the presence of about a 5 to 200% molar excess of potassium hydroxide.

4,130,608

KICK-UP DEVICE FOR A SECONDARY THROTTLE VALVE IN A DIAPHRAGM-TYPE TWO BARREL CARBURETOR

Isamu Ota, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 23, 1977, Ser. No. 835,971
Claims priority, application Japan, May 19, 1977, 52-57915
Int. Cl.² F02M *11/02*
U.S. Cl. 261—23 A **6 Claims**



1. In a diaphragm-type two barrel carburetor having primary and secondary bores including primary and secondary venturi portions respectively, primary and secondary main fuel nozzles provided in said primary and secondary venturi portions respectively, primary and secondary throttle valves provided in said primary and secondary bores respectively, primary and secondary throttle shafts supporting said primary and secondary throttle valves respectively, and a diaphragm means adapted to be actuated by substantially the venturi vacuum of said primary venturi portion so as to open said secondary throttle valve, a kick-up device for said secondary throttle valve comprising a kick lever connected with said primary throttle shaft and having a cam portion, a follower lever connected with said secondary throttle shaft and having a cam follower portion, said cam and cam follower portions being so designed that said secondary throttle valve begins to open when said primary throttle valve is opened beyond a predetermined opening, is gradually more opened as said primary throttle valve is more opened beyond said predetermined opening, and is finally opened up to a predetermined relatively small opening when said primary throttle valve is fully opened, said predetermined relatively small opening being so determined that the air flow caused by such opening of said secondary throttle valve through said secondary venturi portion causes no substantial delivery of fuel from said secondary main fuel nozzle.

4,130,609

STAGED ACCELERATOR PUMP

Timothy Fiedler, Florissant, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 863,883
Int. Cl.² F02M *7/08*
U.S. Cl. 261—23 A **14 Claims**

9. An accelerating pump, comprising:

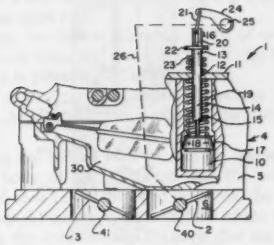
a valve stem having a first end and a second end, said valve stem having a pump means mounted to said first end;

first spring means biased to urge said stem in a pumping direction;

second spring means unbiased in a first position of said stem;

boss means mounted to said stem along the second end thereof; and

drive means including a movable part for urging said valve stem in a pumping direction, said drive means being operatively connected to the second end of said valve stem, movement of said drive means permitting said first spring to urge said stem in a pumping direction until said boss engages said second spring, further movement of said drive means including a first lost motion movement portion and a second direct drive portion whereby said drive means overcomes the force of said second spring and directly drives said stem in a pumping direction.

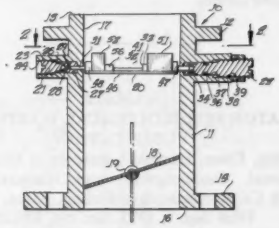


4,130,610

CHARGE FORMING APPARATUS WITH VANE ACTUATED FUEL AIR RATIO CONTROL

Howard C. Paul, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 29, 1977, Ser. No. 865,649
Int. Cl.² F02M *7/14*
U.S. Cl. 261—36 A **2 Claims**



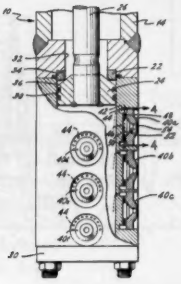
1. Charge forming apparatus for forming a fuel and air mixture including a body member having an air induction passage defined therein, a fuel channel extending across said air induction passage, said fuel channel including an exposed fuel dispersion gap permitting entrainment of fuel in air for forming a fuel-air mixture in said passage, and a movable throttle member disposed downstream of said fuel channel for regulating the rate of flow of air in said induction passage, wherein the improvement comprises means for varying the proportions of fuel mixed with air in said passage in accordance with the rate of flow of air in said passage, including a rotatable mask mounted for rotation with respect to said fuel dispersion gap, and a rotatable vane mounted in said passage and connected to said mask movable responsive to rate of flow of air in said passage for rotating said mask in a direction progressively covering portions of said fuel dispersion gap responsive to increasing rate of flow of air providing desired fuel air ratios over an extended range of air flow rates.

4,130,611

ATTEMPERATOR

Warren H. Brand, Blue Bell, Pa., assignor to Yarway Corporation, Blue Bell, Pa.

Filed Dec. 6, 1976, Ser. No. 748,117
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—66 **10 Claims**



1. An attemperator for spraying a liquid into a gaseous stream, said attemperator comprising a spray tube, means for connecting said spray tube to a high pressure source of liquid, valve means at the entrance to said spray tube for allowing or preventing the flow of liquid into said spray tube, a plurality of nozzle means on said spray tube injecting a fine spray of liquid droplets travelling along an expanding helical path from each nozzle means into the gaseous stream, a plurality of small ports formed in said spray tube with some of said ports being spaced about each nozzle means, each of said small ports communicating between the interior of said spray tube and said nozzle means and each one of said small ports being axially spaced from the other of said small ports, said valve means including a plug member slidably received in sealing engagement with the interior of said spray tube whereby said plug member opens said ports sequentially and controls the flow of liquid of each of said nozzle means.

4,130,612

AERATOR FOR BIOLOGICAL WASTE-WATER PURIFICATION

Albert Wilop, Essen, Germany, assignor to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrückkühlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Germany

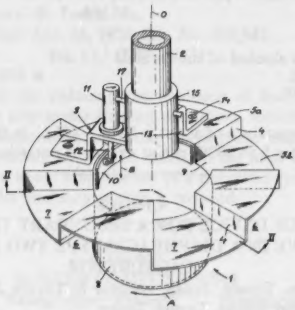
Filed Sep. 2, 1977, Ser. No. 830,335
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734963
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—91 **10 Claims**

1. An aerator for the biological purification of waste water, comprising:

a rotor centered on a substantially vertical axis, said rotor forming sets of first and second radial channels laterally bounded by radially extending webs, said channels having inner ends proximal to said axis and open outer ends remote from said axis;

inlet means on said rotor giving access to the inner ends of said first and second channels from different regions of a surrounding body of water to be purified, said inlet means including an axially extending open-ended central sleeve communicating with the inner ends of said second channels and defining a flow path along which atmospheric air is entrainable by water outflowing through said second channels upon limited immersion of said rotor into said body; and

adjustable control means on said rotor including a cylindrical annular shutter axially displaceable within said sleeve



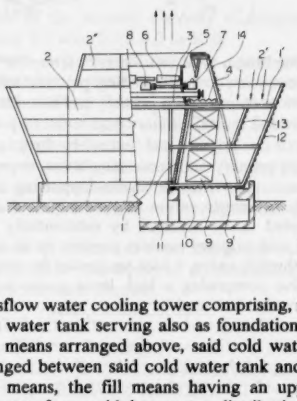
for blocking the inner ends of said second channels to a variable extent.

4,130,613

LOW NOISE COOLING TOWER

Akimasa Hourai, Amagasaki, Japan, assignor to Shinko-Pfaudler Company, Ltd., Kobe, Japan

Filed Dec. 20, 1976, Ser. No. 752,431
Claims priority, application Japan, Jan. 17, 1976, 51-4308
Int. Cl.[2] F28C *1/04*
U.S. Cl. 261—109 **3 Claims**



1. A crossflow water cooling tower comprising, in combination, a cold water tank serving also as foundation; hot water distribution means arranged above, said cold water tank; fill means arranged between said cold water tank and hot water distribution means, the fill means having an upper surface receiving water from said hot water distribution means, a lower surface discharging water into said cold water tank, an outer side adapted to serve as an air inlet face, an inner side adapted to serve as an air outlet face, a front side and a rear side; a pair of substantially vertical, horizontally spaced, substantially imperforate side walls covering said front and rear sides and extending inwardly and outwardly therefrom; a fan deck connecting said side walls; air draft means on said deck having an air outlet for forcing air from said air inlet face through said fill means to said air outlet face in a direction transverse to the flow of water from said hot water distribution means to said cold water tank, and through said air outlet in an upward direction; means for connecting said air draft means to said vertical side walls inwardly of said air outlet face of said fill means; said cold water tank extending outwardly from said air inlet face of said fill means and having an end edge along its outward extremity; and further comprising a first inclined substantially imperforate wall extending outwardly upward from said end edge of said cold water tank along the entire height of said fill means; and each of said vertical side walls having an outer edge connected to said first inclined wall along

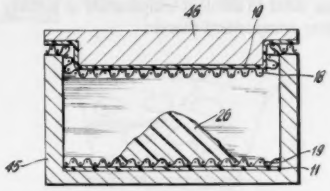
the full height thereof and a lower edge sealed to said cold water tank, thereby defining, with said first inclined wall, an upwardly widening air inlet space having substantially imperforate walls preventing horizontal propagation of low frequency noise, said first inclined wall further causing high frequency noise components to be directed upwards.

4,130,614

METHOD FOR MAKING STRUCTURAL FOAMS WITH FACING SHEETS

Glen E. W. Saidla, Hampton Falls, N.H., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 2, 1976, Ser. No. 654,617
Int. Cl.² B29D *27/04*
U.S. Cl. 264—46.4 **12 Claims**



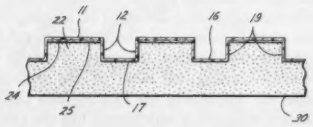
1. In forming a fiber-reinforced structural foam having an exterior layer of a substantially nonporous film material on at least one surface thereof and adherent to said foam by foaming a foamable resin composition in place in a mold first lined with an exterior layer of said film material and next with a first layer of fiber-reinforcing sheet material whereby after the resin composition foams the resulting foam is bonded to the facing sheet without adhesive, the improvement consisting essentially of: charging in the mold on said fiber-reinforcing sheet material a foamable resin composition for foaming therein, said resin composition being charged in an amount sufficient to fill the mold on foaming, and said resin composition having a viscosity prior to foaming such that under the conditions in which the resin composition is charged into the mold the resin would not flow by gravity through the openings between the fibers in the fiber-reinforcing material and form beads on the underside thereof in a time shorter than the foam initiation time; and allowing said resin composition to foam in place and completely fill the mold whereby a fiber-reinforced structural foam having a facing sheet on at least one surface is obtained.

4,130,615

METHOD FOR MAKING AN INSULATED CONTAINER HAVING A SHOCK-RESISTANT BOTTOM

Joseph A. Decker, Jr.; Bipinchandra Amin, and William R. Magruder, all of Houston, Tex., assignors to Igloo Corporation, Houston, Tex.

Filed Apr. 13, 1978, Ser. No. 895,894
Int. Cl.² B29D *27/04*; B29G *7/02*; B29D *9/00, 9/10*
U.S. Cl. 264—46.5 **7 Claims**



1. A method for making an insulated container having a shock-resistant bottom comprising the steps of:

(a) supporting a pliable sheet of a heated plastic-like material near the edges of said material;

(b) forming a liner having a plurality of substantially aligned ridges of the material of step (a), each of said ridges having a top with two sides joining the top with a floor of the plastic-like material, by contacting the material of step (a) with a mold having a plurality of substantially aligned ridges thereon;

(c) cooling the liner of step (b);

(d) applying a quantity of a non-adhering material to the top inside surface of the ridges of step (c);

(e) substantially drying the non-adhering material;

(f) forming a lower container body having a bottom, four sides and an open top;

(g) positioning the lower container body of step (f) in a female fixture whereby the open top of the lower container body is substantially unobstructed;

(h) applying a multiple component, expanding exothermic foam onto the inside bottom surface of the container body of step (g);

(i) positioning the ridged liner of step (e) inside the lower container body of step (h) such that the non-adhering material of step (e) is disposed between the expanding foam of step (h) and top inside surface of the ridges; and

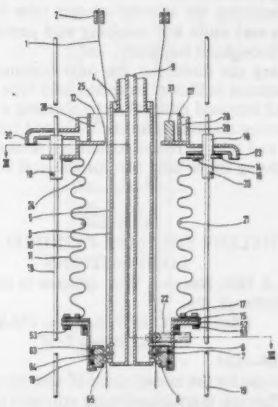
(j) expanding the foam of step (h) such that the expanding exothermic foam heats the non-adhering material and urges and non-adhering material toward the top inside surface of the ridges such that the foam adheres to the floor and the sides of the ridges not in contact with the non-adhering material and to the lower container body thereby producing an insulated container having a bonded inside liner, the bottom of said liner having ridges therealong, the tops of which are reasonably shock-resistant.

4,130,616

TUBULAR EXTRUDATE

Michael L. Clifford, St-Martens-Latem, Belgium, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 7, 1977, Ser. No. 804,375
Claims priority, application United Kingdom, Mar. 21, 1977, 11808/77
Int. Cl.² B29C *17/00*; B29D *23/04*
U.S. Cl. 264—514 **9 Claims**



1. A method of producing a polymeric tubular film comprising

extruding a tube of a film-forming polymeric material,

passing the extruded tube over and around an internal cooling mandrel,

axially withdrawing the tube while supported on the mandrel through a bath of cooling liquid such that the external surface of the tube contacts in sequence

(a) a quiescent zone, of surface area A, of cooling liquid exhibiting laminar flow,

(b) a zone, of restricted cross-sectional area B, of cooling liquid exhibiting transitional flow, and

(c) a zone, of cross-sectional area C, of cooling liquid exhibiting substantially spiral turbulent flow around the surface of the tube,

the flow of cooling liquid in each of said zones being substantially countercurrent to the direction of movement of the tube, and

the surface areas of said zones being such that $A > \lambda$ $B < C$, and

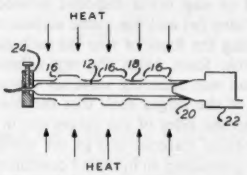
thereafter converting the cooled tube to tubular film.

4,130,617

METHOD OF MAKING ENDOTRACHEAL TUBE CUFFS

Dean R. Wallace, Ft. Myers, Fla., assignor to Airco, Inc., Montvale, N.J.

Filed Dec. 30, 1977, Ser. No. 865,825
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—528 **8 Claims**



1. A method of producing cuffs for endotracheal tubes comprising the steps of:

(a) providing an elastomeric thermoplastic tube of predetermined elasticity, diameter and wall thickness;

(b) positioning the tube within a vented hollow mold having an internal configuration in the shape of at least one desired cuff;

(c) prestretching the tube a predetermined amount along its longitudinal axis, and maintaining said prestretch throughout steps (d) and (e) to minimize longitudinal expansion during pressurizing;

(d) pressurizing the interior of said tube while contained within said mold and retaining said pressure within said tube throughout step (e);

(e) heating the mold and the tube contained within, at a temperature sufficient to soften said tube and cause it to expand into said mold, thereby forming a cuff;

(f) removing the heat from the mold and tube to allow said mold and tube to return to ambient temperature; and

(g) removing the at least one formed cuff from the mold.

4,130,618

ETHYLENE POLYMER-PETROLEUM WAX COMPOSITIONS

Donald R. J. Hill, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 1, 1977, Ser. No. 856,475
Int. Cl.[2] B29G *7/00*
U.S. Cl. 264—123 **15 Claims**

1. A process for the manufacture of a finely-divided, particulate, free-flowing thermohardening ethylene polymer composition which consists essentially of intimate mixing 40 to 150 parts by weight of melted petroleum wax with 100 parts by weight of a finely-divided particle form ethylene polymer having a bulk density of less than about 20 lbs/ft.^{3}, an annealed density of at least 0.95 and an intrinsic viscosity of at least about 3, adsorbing said melted wax on the polymer particles and recovering a free-flowing particulate product that is essentially physically indistinguishable from the initially charged ethylene polymer; said petroleum wax being selected from the group consisting of a paraffin wax, an intermediate wax, and a microcrystalline wax; said paraffin wax having a melting point range of 120°–160° F., a molecular weight range of 340–400, a density range of 0.80–0.917, a gravity range of 35°–60° API at 210° F. and a 5% distillation point of 750°–810° F. (vacuum corrected to 760 mm Hg); said intermediate wax having a melting point range of 130°–160° F., a molecular weight range of 360–550, a density range of 0.85–0.93, a gravity range of 30°–55° API at 210° F. and a 5% distillation point of 825°–900° F. (vacuum corrected to 760 mm Hg); said microcrystalline wax having a melting point range of 130°–180° F., a molecular weight range of 500–600, a density range of 0.89–0.94, a gravity range of 30°–50° API at 210° F. and a 5% distillation point of 950°–1,050° F. (vacuum corrected to 760 mm Hg).

6. A finely-divided, particulate, free flowing thermohardening ethylene polymer composition prepared by the method of claim 1.

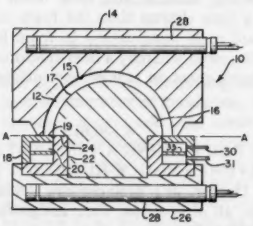
7. A pressure free process for preparing castings of an ethylene polymer composition which consists essentially of filling a mold with a thermohardening ethylene polymer composition of claim 6, melting the ethylene polymer composition, and then cooling the mold to ambient temperature to solidify the ethylene polymer composition therein.

4,130,619

APPARATUS AND METHOD OF MAKING HOLLOW ARTICLES

Franklin W. Held, San Diego, Calif., assignor to Ektelon, San Diego, Calif.

Filed Jun. 16, 1977, Ser. No. 806,997
Int. Cl.[2] B29C *5/00, 17/00;* B29H *7/02*
U.S. Cl. 264—162 **11 Claims**



1. A method of making hollow articles from a vulcanizable, elastic material comprising the steps of; shaping and molding a mass of the elastic material to a hollow, semi-spherical form in a first mold cavity, heating the mass of elastic material and simultaneously cooling the edge of the semi-sphere of the elastic material, continuing the heating and cooling until the mass of elastic material is vulcanized but the continuous edge portion of the material is not fully vulcanized, removing the semi-sphere from a first mold, roughening said edges of said semi-sphere, transferring two of said semi-spheres to a second mold having a spherical cavity therein, and abutting the edges of said two semi-spheres and forcing the edges together while heating at least the edge portions to vulcanize them together and form a hollow sphere, said first mold including a first mold

member having a semi-spherical cavity, a second mold member having a convex semi-spherical portion adapted to mate with said first mold member in spaced relation thereto and an annular cooling means abutting said first mold and said second mold and defining said first mold cavity therebetween, and passing a cooling fluid through said cooling means while heating said second mold, said fluid being insulated from said second mold.

4,130,620

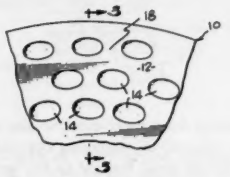
METHOD FOR MAKING VIDEO DISCS AND VIDEO DISC MOLDS

Manfred H. Jarsen, Encino, Calif., assignor to MCA Disco-Vision, Inc., Universal City, Calif.

Division of Ser. No. 406,686, Oct. 15, 1973, abandoned. This application Dec. 22, 1976, Ser. No. 753,184

Int. Cl.[2] B29C *5/00, 5/04;* **B29H** *3/042*

U.S. Cl. 264—225 **3 Claims**



1. A process for producing a video disc comprising the steps of:

forming a master matrix including a substrate having a flat first surface carrying a video information track, and said information track being in the form of a series or photoresist members, and said members are generally arranged in a concentric, spiral track, and each member having a constant dimension in a radial direction and a constant maximum dimension in a direction perpendicular to said surface, and the length of each member in the circumferential direction and the distance between adjacent member in the circumferential direction being representative of the video information; pouring a silicone rubber compound over the surface of the master matrix to a uniform depth; applying a uniform pressure over said poured compound, heating said compound until cured while applying said uniform pressure, separating said cured elastomer from said matrix thereby forming an elastomeric mold member and casting a replica video disc from said mold member, and said replica video disc having a first surface carrying a replicated copy of said information track carried by said first surface of said substrate.

4,130,621

METHOD FOR MANUFACTURING A DOOR CATCH MADE OF A SYNTHETIC RESIN

Seiji Sugasawara, Chiba, Japan, assignor to Sugatsune Industrial Co., Ltd., Chiba, Japan

Filed Jan. 27, 1978, Ser. No. 872,799

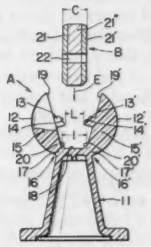
Claims priority, application Japan, Jan. 31, 1977, 52-9454

Int. Cl.[2] B29C *27/00, 27/30*

U.S. Cl. 264—230 **4 Claims**

1. A method for manufacturing a door catch made of a synthetic resin, comprising:

forming a support member by molding right and left support elements and a leg portion of said member integrally by the use of a shrinkable thermoplastic synthetic resin, said right and left support elements having mounting arbors, for a magnet board for attracting and holding a door, protruding therefrom and opposed to each other, base ends of said support elements being continuous to an upper end of said leg portion, lower parts of the opposing support elements being made a spacing corresponding to a thickness of said magnet board; expanding upper parts of said opposing support elements to a spacing permitting said magnet board to be sandwiched therebetween, overlay parts being disposed in the shape of diagonal bracing at those inner corner parts in said base ends of said support elements which are formed by an upper end face of said



leg portion and inner faces of the respective support elements; interposing said magnet board between both said support elements said magnet board being provided with a mounting hole; and causing the resin material to shrink, to snugly fit said mounting arbors into said mounting hole of the interposed magnet board and to sandwich and fix said magnet board between said support elements.

4,130,622

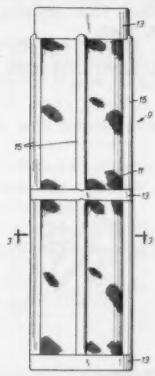
METHOD OF MAKING SELF-SUPPORTING TUBULAR FILTER

Kenneth E. Pawlak, Mundelein, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 770,890, Feb. 22, 1977, abandoned. This application Nov. 23, 1977, Ser. No. 854,161

Int. Cl.[2] B29F *1/00*

U.S. Cl. 264—255 **5 Claims**



1. The process of making a self-supporting tubular filter comprising the steps of:

(a) providing a sleeve of filter material having a longitudinal line of weakness therealong,

(b) providing a core pin having outer dimensions slightly less than the inner dimensions of said sleeve and including a longitudinal channel therealong,

(c) inserting said core pin into said sleeve with said longitudinal line of weakness aligned above said channel,

(d) providing a first female mold having a cavity complementary to said ensleeved pin, said cavity including a longitudinal groove therealong,

(e) enclosing said ensleeved pin inside said first female mold

with said line of weakness, said channel and said groove in alignment,

(f) injecting a thermoplastic material into said channel of said core pin until said channel becomes filled and said injected thermoplastic material forces outwardly against said sleeve at said longitudinal line of weakness separating said sleeve thereat and filling said groove of said female mold,

(g) allowing said thermoplastic material to solidify while in contact with said separated sleeve so that said solidified material in said filled channel and groove form an integral rib splicing said sleeve, said rib being attached to the internal surfaces of said sleeve adjacent to said separation and extending through said separation a predetermined distance external to said sleeve,

(h) removing said ensleeved core pin from said first female mold,

(i) providing a second female mold having a cavity complementary to said ensleeved pin, said second female mold cavity including a longitudinal groove therealong having the capacity to receive said portion of said rib external to said sleeve,

(j) enclosing said ensleeved pin inside said second female mold with said portion of said rib external to said sleeve and said groove of said second female mold cavity in alignment,

(k) injecting thermoplastic material into said groove of said second female mold cavity until said groove is filled and allowing said injected thermoplastic material to solidify so that it overlies and attaches to the external surfaces of said sleeve adjacent to said separation,

(l) removing said ensleeved pin from said second female mold; and

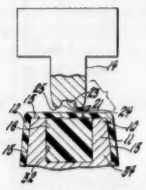
(m) removing said sleeve from said core pin; whereby a self-supporting tubular filter having an integral rib splicing a longitudinal separation of said sleeve both internally and externally is formed.

4,130,623

METHOD OF EMBOSSING

John O. Walter, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1976, Ser. No. 675,875
Int. Cl.[2] B29C *3/00*; B29F *5/00*
U.S. Cl. 264—293 **3 Claims**



1. A method of embossing a linear simulated stitching design onto the surface of a thermoformable plastic sheet which has been preheated to a thermoforming temperature and which has a thickness in the range of from about 15 to about 100 mils, said method comprising the steps of:

(a) pressing the preheated sheet between an embossing die having features to impart said stitching design onto said sheet and an elastomeric anvil which is inlaid into the surface of a support member and being arranged in the course of said design, the support member restricting the lateral displacement of the anvil closely adjacent the design during pressing so that the anvil reacts to the pressure of the die by forcing the sheet closely against the entire embossing surface of the die to more faithfully reproduce the stitching design thereon; and then

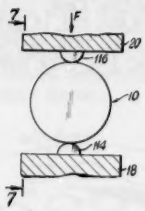
(b) separating the die and the anvil and removing the embossed sheet therefrom.

4,130,624

PIEZO-ELECTRIC DISC MOUNTING METHODS AND APPARATUS

Richard K. Walker, Convent Station, N.J., assignor to Ohaus Scale Corporation, Florham Park, N.J.

Filed Nov. 3, 1977, Ser. No. 848,134
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—328 **36 Claims**



21. A mounting for a piezo-electric disc comprising opposing anvils for respectively engaging opposing segments of the edge of the disc in seats formed in the anvils by applying a proof load to the edge of the disc through the anvils while an extreme pressure lubricant is present between the edge of the disc and the anvils so that the anvils are plastically deformed by the edge of the disc to form the seats, the material of the anvils being selected to have an initial yield stress at least 50% of the critical yield stress and a yield stress after plastic deformation less than 200% of the initial yield stress at the point of maximum plastic deformation, and the selected anvil material being elastic after plastic deformation.

4,130,625

RECOVERY AND PURIFICATION OF IRIDIUM

Ann P. Evers, Roodepoort; Roderick I. Edwards, Honeydew, and Monika M. Fieberg, Johannesburg, all of South Africa, assignors to The National Institute for Metallurgy, Randburg, South Africa

Filed Jun. 15, 1977, Ser. No. 806,818
Claims priority, application South Africa, Jun. 21, 1976, 76/3681
Int. Cl.[2] C01G *55/00*
U.S. Cl. 423—22 **9 Claims**

1. A method of separating iridium from a solution thereof also containing rhodium the method comprising the steps of:

(1) oxidizing the solution in the presence of hydrochloric acid to convert the iridium contained therein to the Ir(IV) oxidation state;

(2) passing the solution into contact with an anion exchange resin to retain the oxidized iridium on the resin;

(3) washing the resin with a dilute hydrochloric acid solution to remove any solution entrained therein;

(4) contacting the washed resin with a substantially chloride free solution of sulphur dioxide in water thereby reducing the iridium to the Ir(111) oxidation state and simultaneously forming iridium sulphito-chloro-complexes;

(5) eluting the resin with a hydrochloric acid solution to remove the iridium sulphito-chloro complexes therefrom;

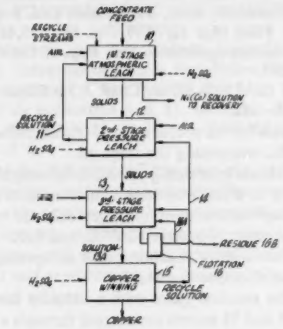
(6) boiling the resultant solution containing the iridium sulphito-chloro complexes to convert the iridium to the chloro-complex with the iridium in the Ir(III) oxidation state and to simultaneously remove sulphur dioxide; and

(7) recovering the iridium from the solution resulting from step (6) above.

4,130,626
FLOTATION SEPARATION OF IRON OXIDE FROM UNDIGESTED MATTE PARTICLES OBTAINED FROM AUTOCLAVE LEACH RESIDUES

Raul M. Hoover, Arvada, Colo., assignor to Amax Inc., Greenwich, Conn.

Filed Oct. 31, 1977, Ser. No. 847,256
Int. Cl.[2] C01G *3/10, 53/10*
U.S. Cl. 423—26 11 Claims



5. In the acid leaching of comminuted copper nickel matte containing about 30% to 70% nickel, about 5% to 40% copper, 0.5% to 20% iron, about 5% to 25% sulfur, the sum of the nickel, copper, iron and sulfur contents being at least about 85% be weight of said matte, wherein said comminuted matte is atmospherically leached with a sulfuric acid-containing solution to effect selective dissolution of a substantial amount of nickel in said matte and provide an atmospheric leach matte residue which in the form of a slurry is thereafter subjected to at least one high pressure high temperature oxidation leach in an autoclave to dissolve substantial amounts of nickel and copper from said atmospheric leach residue and provide a pregnant liquor thereof and a residue comprising undigested matte and iron oxide in flotation separable form, and wherein said slurry is subjected to liquid/solid separation to effect separation of said pregnant liquor from said residue containing said iron oxide and said undigested matte, the improvement comprising,

subjecting an aqueous slurry of said autoclave leach residue to flotation in a flotation cell without the addition of a flotation agent by bubbling air therethrough,

continuing bubbling air through said aqueous medium to float selectively said undigested matte and form a froth containing undigested matte particles and a tailings containing substantially said iron oxide,

collecting said froth and disposing of said iron oxide-containing tailings.

4,130,627
PROCESS FOR RECOVERING MINERAL VALUES FROM FLY ASH

James J. Russ, 1702 Tamarack La., Germantown, Tenn. 38138; James S. Russ, 504 Glen Arden Pl., Pittsburgh, Pa. 15208, and Richard T. Heagy, 1877 Brierbrook Rd., Germantown, Tenn. 38138

Filed Jun. 20, 1977, Ser. No. 807,807
Int. Cl.[2] C01F *7/02;* C25C *1/06*
U.S. Cl. 423—127 11 Claims

1. A process comprising:

(a) blending and heating fly ash with water at a temperature in the range of about 90° C. to about 135° C. and a pH in the range of about 11 to about 14 to form an alkaline aqueous blend;

(b) filtering said alkaline aqueous blend and recovering solids therefrom;

(c) leaching said solids with hydrochloric or hydrofluoric acid to form dissolved chloride or fluoride compounds comprising iron and aluminum;

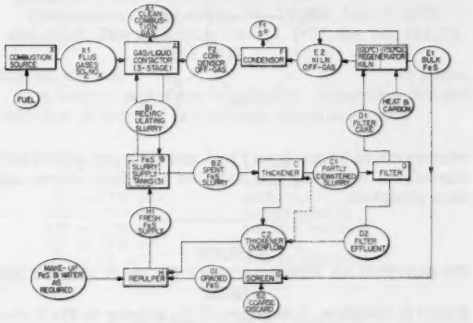
(d) electrolyzing said dissolved chloride or fluoride compounds to plate out at least said iron; and

(e) separating silicon dioxide as a precipitate from the electrolyzed solution and recovering the electrolyzed solution free of silicon dioxide.

4,130,628
PROCESS FOR REMOVING SO_2 AND NO_x FROM GASES

Hubert L. Barnes, State College, and Edward Shapiro, Pittsburgh, both of Pa., assignors to Pittsburgh Environmental and Energy Systems, Inc., Pittsburgh, Pa.

Filed Aug. 22, 1977, Ser. No. 826,962
Int. Cl.[2] C01B *21/00*
U.S. Cl. 423—235 4 Claims



1. A process for removing sulfur dioxide and nitrogen oxides from gases which comprises:

a. Scrubbing said gases in a scrubber with ferrous sulfide in the presence of H_2O wherein the mole ratio of FeS to SO_2 in the scrubber is at least 1.5 to 1 at a temperature of ambient to 100° C. and a pH of at least 5.5, to produce FeS_2 and $FeSO_4$ with minimal formation of Fe_2O_3 and sulfur;

b. Removing said FeS_2 and $FeSO_4$ and heating in a reducing atmosphere at a temperature of 650° to 900° C. to regenerate said FeS and form sulfur;

c. Recycling said regenerated FeS to said scrubber to scrub additional SO_2 and NO_x containing gases.

4,130,629
CONTROL OF HALOMETHYL ETHER EMISSIONS

Joseph J. Velenovsky, Linthicum Heights, Md., and Manuel Alvarez, East Brunswick, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 16, 1977, Ser. No. 861,143
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—240 3 Claims

1. A method for removing halomethyl ethers from a gaseous effluent stream comprising contacting said stream with an aqueous scrubbing solution consisting essentially of water, an alkali metal hydroxide, a lower alkylene glycol having 2 to 4 carbon atoms and a lower dialkanolamine having 4 to 6 carbon atoms.

4,130,630
PROCESS OF STABILIZATION OF ANHYDROUS DIBASIC CALCIUM PHOSPHATE AGAINST FLUORINE IONS WITH CYCLIC AMINOPHOSPHONIC ACIDS

Walter Plöger, Hilden; and Claus Gutzschebauch, Neuss, both of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Germany

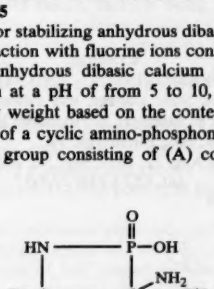
Filed Dec. 1, 1975, Ser. No. 636,733

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1974, 2456667

Int. Cl.[2] C01B *15/16, 25/26*

U.S. Cl. 423—265 5 Claims

1. A process for stabilizing anhydrous dibasic calcium phosphate against reaction with fluorine ions consisting essentially of suspending anhydrous dibasic calcium phosphate in an aqueous medium at a pH of from 5 to 10, containing from 0.01% to 5% by weight based on the content of dibasic calcium phosphate of a cyclic amino-phosphonic compound selected from the group consisting of (A) compounds of the formula



wherein n is an integer from 1 to 3, and (B) water-soluble salts thereof, and separating said stabilized anhydrous dibasic calcium phosphate.

4,130,631
BN BONDED BN FIBER ARTICLE FROM BORIC OXIDE FIBER

Robert S. Hamilton, Youngstown, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,588

Int. Cl.[2] C01B *35/08;* H01M *8/14*

U.S. Cl. 423—290 32 Claims

1. A method for manufacturing a boron nitride article comprising:

(a) blending from about 0.5 to about 40 weight percent of boric acid with from about 60 to about 99.5 weight percent of boron oxide fiber;

(b) forming a shaped article with the resulting blend;

(c) heating the article in an anhydrous gas selected from the group consisting of inert gases, nitrogen, ammonia and mixtures thereof to a temperature above the melting temperature of the boric acid and below about 265° C. for a time sufficient to melt at least some of the boric acid to the fibers; and

(d) heating the article in an ammonia atmosphere to a sufficient temperature and for a sufficient time to convert essentially all of the boric acid and boron oxide to boron nitride.

31. In an electric cell incorporating molten lithium chloride and a porous separator, the improvement wherein said separator comprises a flexible boron nitride fiber mat manufactured by:

(a) blending from about 0.5 to about 40 weight percent of boric acid with from about 60 to about 99.5 weight percent of boron oxide fiber;

(b) forming a shaped mat with the resulting blend;

(c) heating the mat in an anhydrous gas selected from the group consisting of inert gases, nitrogen, ammonia and mixtures thereof to a temperature above the melting temperature of the boric acid and below about 265° C. for a time sufficient to melt at least some of the boric acid to the fibers; and

(d) heating the mat in an ammonia atmosphere to a sufficient temperature and for a sufficient time to convert essentially all of the boric acid and boron oxide to boron nitride.

4,130,632
PROCESS FOR THE MANUFACTURE OF TRICHLOROSILANE AND SILICON TETRACHLORIDE

Johann Braunsperger, Buch, Inn; Winfried Lang, and Thorgard Zainer, both of Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,467

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623290

Int. Cl.[2] C01B *33/08;* C01F *7/56;* C01G *49/10*

U.S. Cl. 423—342 2 Claims

1. A process for the preparation of trichlorosilane and silicon tetrachloride, comprising the steps of:

reacting silicon containing up to 2% by weight of aluminum and iron in a reaction zone with a member selected from the group consisting of hydrogen chloride and chlorine at a temperature of between 260° C. and 1200° C. to produce silicon-containing reaction gases comprising trichlorosilane and silicon tetrachloride;

passing the reaction gases with a velocity flow of between about 6 and 15 meters per second through a water-cooled tube to effect cooling thereof to a temperature of between about 40° C. and 130° C. to cause precipitation of solid substances composed of aluminum chloride and ferric chloride within said tube but to prevent precipitation of said solid substances on the walls of said tube;

passing the cooled gases containing the precipitated solid substances leaving said tube to a filtering device to filter off said solid substances and then passing the gases leaving the filtering device to a condensation system to separate out the trichlorosilane and silicon tetrachloride, said filtering device having filters on which said solid substances are deposited and a container in which the precipitated solid substances may be collected.

4,130,633
REMOVAL OF SELENIUM FROM URETHANE SOLUTIONS

Edward T. Shawl, Wallingford, Pa.; Ming N. Sheng, Cherry Hill, N.J., and John G. Zajacek, Devon, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 27, 1977, Ser. No. 864,172

Int. Cl.[2] C01B *19/00*

U.S. Cl. 423—509 19 Claims

1. A process for the recovery of selenium from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises the steps of:

distilling the reaction product seleniumcontaining urethane solution at a temperature of from about ambient to about 200° C. to remove unreacted hydroxyl compounds and any contained amine base compunds and/or water;

adding an essentially water insoluble aromatic hydrocarbon or nitro, phenyl, alkyl or halogen substituted aromatic hydrocarbon to said distilled urethane solution forming a hydrocarbon-urethane-selenium containing solution;

contacting the hydrocarbon-urethane-selenium solution at a temperature of between about 25° C. and 120° C. with an aqueous hydrogen peroxide solution having a hydrogen peroxide concentration of between about 0.5 and 50 weight percent to react with and extract selenium compounds from said solution and form a selenium-containing aqueous hydrogen peroxide phase and a urethane-containing hydrocarbon phase;

separating the selenium-containing aqueous hydrogen peroxide phase from the hydrocarbon phase;

treating the aqueous hydrogen peroxide phase to separate selenium compounds therefrom; and

recovering said selenium.

4,130,634
METHOD FOR DETECTING AND QUANTIFYING ANTIGENS

Giuseppe A. Molinaro, and Sheldon Dray, both of Chicago, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Continuation-in-part of Ser. No. 451,685, Mar. 15, 1974, abandoned. This application Aug. 11, 1976, Ser. No. 713,348

Int. Cl.[2] G01N *13/00, 21/06, 31/00, 33/00*

U.S. Cl. 424—8 **4 Claims**

1. A method for detecting the presence of a particular antigen in a composition which method comprises contacting said composition with erythrocytes having coupled thereto antibodies specific to said antigen, adding a developer comprising antibody reactive with said antigen, adding complement, and noting lysis of said erythrocytes as a positive indication of the presence of said antigen.

4,130,635
CALCULUS INHIBITION

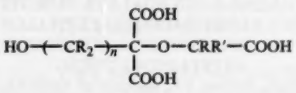
David R. Dyroff, Creve Couer, Mo., and Walton F. Suchanek, Jr., Belleville, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 22, 1976, Ser. No. 744,220

Int. Cl.[2] A61K *7/16, 7/24*

U.S. Cl. 424—48 **17 Claims**

1. An oral composition effective in inhibiting formation of dental calculus, said composition comprising (1) a propanedioic acid compound selected from the group consisting of acids having the structural formula:



wherein R is hydrogen or lower alkyl, R′ is lower alkyl, n is 1 or 2 and each R can be the same as or different from any other R in said formula, and pharmaceutically acceptable salts of said acids and (2) a carrier suitable for use in the oral cavity, said compound being present in said composition in amount and concentration sufficient to substantially inhibit formation of dental calculus.

4,130,636
DENTIFRICE

Kenneth Tomlinson, Bramhall, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 27, 1977, Ser. No. 819,528

Int. Cl.[2] A61K *7/16, 7/18*

U.S. Cl. 424—52 **14 Claims**

1. A dental cream dentifrice free from bitter taste of surfactant comprising about 15–75% by weight a water-insoluble dental polishing agent in a dental cream vehicle and containing therein as the essential surfactant about 0.05–5.0% by weight of a substantially tasteless surfactant having the general formula, $R(OCH_2CH_2)_xOCH_2COOM$, wherein R is a C_{8-18} alkyl, x is an integer of about 1–9 and M is selected from the group consisting of non-toxic alkali and alkaline earth metals, ammonium and C_2 to C_3 alkylol amines.

4,130,637
ANTI-PLAQUE AGENTS

Robert A. Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 764,122, Jan. 31, 1977, abandoned. This application Oct. 3, 1977, Ser. No. 839,154

Int. Cl.[2] A61K *7/22*

U.S. Cl. 124—54 **9 Claims**

1. A non-staining, anti-plaque oral composition containing an effective antimicrobial amount of a betaine represented by the general formula:

$$RN^+(CH_3)_2(CH_2)_nCOO^-,$$

wherein R is an alkyl group containing 12 to 18 carbon atoms and n is an integer from 8 to 12, in an oral vehicle.

4,130,638
MOUTHWASH COMPOSITIONS

Dadi J. Dhabhar; Allen Heyd, both of Norwalk, Conn., and Eugene H. Gans, Hastings-on-Hudson, N.Y., assignors to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 738,584, Nov. 3, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,221

Int. Cl.[2] A61K *7/16, 7/24*

U.S. Cl. 424—55 **7 Claims**

1. A sodium ricinoleate mouthwash composition substantially free of haze and precipitation comprising about:

10 to 25% v/v	alcohol
5 to 15% v/v	sorbitol
0.5 to 2.5% w/v	surfactant
0.25 to 1% w/v	sodium chloride
0.05 to 0.2% w/v	insoluble saccharin
0.01 to .25% w/v	flavoring
0.1 to 2% w/v	sodium ricinoleate
q.s.	water

and wherein the flavoring agent is selected from the group consisting of menthol, thymol, eucalyptol and anethol or mixtures thereof with peppermint oil.

4,130,639
ABSORBABLE PHARMACEUTICAL COMPOSITIONS BASED ON ISOMORPHIC COPOLYOXALATES

Shalaby W. Shalaby, Long Valley, and Dennis D. Jamiolkowski, Paterson, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Sep. 28, 1977, Ser. No. 837,060

Int. Cl.[2] A61K *31/74, 31/56*

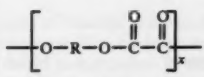
U.S. Cl. 424—78 **15 Claims**

1. In a pharmaceutical depot composition for parenteral administration of effective amounts of a drug released slowly over an extended period of time which comprises a combination of

(a) from 1 percent to 99 percent by weight of composition of a drug in an effective depot amount greater than the single dose amount, and

(b) a solid, absorbable polymer which is nonreactive toward body tissue and which undergoes biodegradation in the presence of body fluids into products which are metabolized or excreted by the body without adverse body reaction,

the improvement comprising employing as said absorbable polymer isomorphic polyoxalate polymers comprising units of cyclic and linear oxalates and having the general formula



wherein each R is

$$-(CH_2)_n-A-(CH_2)_n- \quad I$$

or

$$-(CH_2)-4+2n \quad II$$

and from about 5 to 95 mole percent of the R units are I; A is trans 1,4-cyclohexylene or p-phenylene, n is 1 or 2 and is the same for I and II, and x is the degree of polymerization resulting in a polymer having an inherent viscosity of at least 0.20 determined at 25° C. in a 0.1 g/dl solution of polymer in chloroform or hexafluoroisopropanol.

4,130,640
GERMICIDAL CLEANING COMPOSITIONS

Reuwen R. Chazan, deceased, late of Savyon, Israel by Dan Chazan, heir; David Y. Chazan, heir, both of Savyon, Israel, and Eliezer Z. Fischer, 8 Levitan St., Ramat-Aviv, Tel-Aviv, Israel

Continuation of Ser. No. 609,842, Sep. 2, 1975, abandoned. This application Jul. 7, 1977, Ser. No. 813,779
Claims priority, application Israel, Sep. 10, 1974, 45639
Int. Cl.[2] A61K *31/79*
U.S. Cl. 424—80 **7 Claims**

1. A germicidal composition in, bar-soap form comprising in combination:

a. 20 weight-% to 70 weight-% of a member selected from the group consisting of sulfated fatty alcohols (C_{14} to C_{26}), sulfosuccinates of fatty alcohols (C_{12} to C_{24}) and mixtures thereof;

b. between 1 and 20 weight-% of an iodophor selected from the group consisting of an organic iodine complex, and iodine in combination with potassium or sodium iodide;

c. a quantity not exceeding about 10 weight-% of water;

d. 20 weight-% to 60 weight-% of a member selected from the group consisting of saturated fatty alcohols (C_{14} to C_{26}), saturated fatty acids (C_{14} to C_{20}), succinates or maleates of fatty alcohols (C_{10} to C_{24}) and mixtures thereof.

4,130,641
INDUCTION OF INTERFERON PRODUCTION BY MODIFIED NUCLEIC ACID COMPLEXES

Paul O. P. Ts'o, 2117 Folkstine Rd., Timonium, Md. 21093, and William A. Carter, Orchard Park, N.Y.

Division of Ser. No. 411,119, Oct. 30, 1973, Pat. No. 4,022,222. This application Sep. 24, 1976, Ser. No. 722,293
Int. Cl.[2] A61K *45/04;* **C07H** *21/02*
U.S. Cl. 424—85 **11 Claims**

5. A method of therapeutically inducing interferon production in a human in need of such therapy, which method comprises:

administering to the human an effective amount of a complex selected from the group consisting of poly(I)·poly(C_n,U) and poly(I)·poly(C_n,G), wherein n is an integer having a value of from 4 to 29 to induce interferon.

4,130,642
METHOD OF SEPARATING BLOOD CELLS COMPONENTS

Kiyomi Kikugawa, Mino, and Kyoko Minoshima, Tokyo, both of Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Oct. 28, 1977, Ser. No. 846,369
Claims priority, application Japan, Nov. 2, 1976, 51-132191
Int. Cl.[2] A61K *35/14, 35/18*
U.S. Cl. 424—101 **10 Claims**

1. A method of separating blood cells components, comprising the step of passing blood cells suspension containing red cells and at least one of leukocytes or blood platelets through a column packed with a de-fatted and bleached Egyptian cotton so as to allow the blood cells components other than red cells to be adsorbed on the Egyptian cotton and to isolate the red cells portion alone.

4,130,643
DERMATOLOGICAL COMPOSITIONS

Donald E. Smith, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 647,943, Jan. 12, 1976, Pat. No. 4,046,886, which is a division of Ser. No. 541,902, Jan. 17, 1975, Pat. No. 3,925,099, which is a division of Ser. No. 340,787, Jul. 22, 1975, Pat. No. 3,896,238, which is a continuation-in-part of Ser. No. 241,404, Apr. 5, 1972, abandoned. This application Jun. 13, 1977, Ser. No. 805,668
Int. Cl.[2] A61K *31/56, 31/58, 47/00*
U.S. Cl. 424—238 **2 Claims**

1. A composition in liquid or semi-liquid form adapted to topical application to animal tissue comprising:

(1) from about 0.025% to about 2.5% by weight of a steroid;

(2) from about 0.1% to about 1.0% by weight of a sugar ester selected from the group consisting of
sucrose monooctanoate,
sucrose monodecanoate,
sucrose monolaurate,
sucrose monomyristate,
sucrose monopalmitate,
sucrose monostearate,
sucrose monooleate, and
sucrose dioleate; and

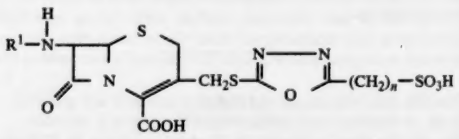
(3) from about 0.1% to about 10.0% by weight of a sulfoxide compound selected from the group consisting of
octyl methyl sulfoxide,
nonyl methyl sulfoxide,
decyl methyl sulfoxide,
undecyl methyl sulfoxide,
dodecyl methyl sulfoxide,
2-hydroxydecyl methyl sulfoxide,
2-hydroxyundecyl methyl sulfoxide, and
2-hydroxydodecyl methyl sulfoxide.

4,130,644
7-ACYLAMINE-3-(SULFOALKYL SUBSTITUTED OXADIAZOLYLTHIOMETHYL) CEPHALOSPORINS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

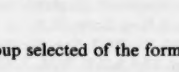
Division of Ser. No. 666,095, Mar. 11, 1976, Pat. No. 4,041,162. This application Apr. 25, 1977, Ser. No. 790,715
Int. Cl.[2] A61K *31/545;* **C07D** *501/50, 271/10*
U.S. Cl. 424—246 **9 Claims**

1. A compound of the formula:



in which:

R^1 is an acyl group selected of the formula:



where:

Z is methyl, trifluoromethyl, trifluoroethyl, pyridyl or cyanomethyl;

m is zero to two; and

n is one to five, or a non-toxic pharmaceutically acceptable salt thereof.

6. An antibacterially effective pharmaceutical composition comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

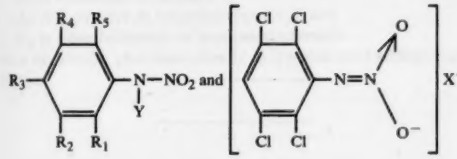
8. A method of treating bacterial infections comprising administering internally by injection to an infected or susceptible warm-blooded animal an antibacterially effective but nontoxic dose of a compound as claimed in claim 1.

4,130,645
FUNGICIDAL PHENYLNITRAMINES AND NEW PHENYLNITRAMINES

Barrington Cross, Rocky Hill, and David H. Dawe, Hightstown, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

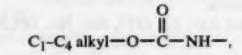
Filed Feb. 21, 1978, Ser. No. 879,340
Int. Cl.[2] A61K *31/535, 31/135;* **C07C** *79/00;* **C07D** *295/22*
U.S. Cl. 424—226 **24 Claims**

1. A method for the control of fungi, comprising contacting said fungi with a fungicidally effective amount of a compound selected from formulae (I) and (III):

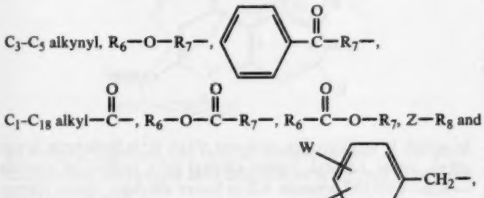


(I) (III)

wherein the formula (I) R groups R_1 to R_5 each represent a member selected from the group consisting of hydrogen, halogen, C_1–C_4 alkyl, halo(C_1–C_4) alkyl, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, C_1–C_4 alkanoylamino,

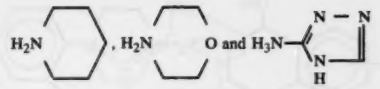


cyano and nitro; Y is a member selected from the group consisting of hydrogen, C_1–C_8 alkyl, C_3–C_8 alkenyl,

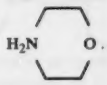


wherein

R_6 is C_1–C_4 alkyl, C_3–C_5 alkenyl or C_3–C_5 alkynyl; R_7 is C_1–C_4 alkylene; R_8 is C_2–C_4 alkylene; W and W′ each are hydrogen or halogen; Z is hydroxy or halogen; with the provisos, that at least two of the R groups R_1 to R_5 are other than hydrogen; and that not more than two of the R groups R_1 to R_5 are C_1 –C_4 alkylthio, C_1 –C_4 alkylsulfonyl or nitro; and wherein the formula (III) cation X represents a member selected from the group H_3NR', $H_2NR'R''$, $HNR'R''R'''$, and $NR'R''R'''R''''$. wherein the R groups R′ to R′′′′ each represent a member selected from C_1–C_{18} alkyl, aryl and benzyl, and where R′ and R″ taken together with the nitrogen to which they are attached form a cyclic moiety selected from



12. A method according to claim 1, wherein said compound is the salt of 2,3,5,6-tetrachlorophenylnitramine where X is

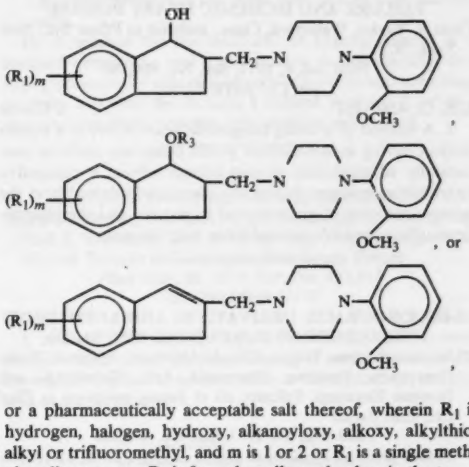


4,130,646
1,2,3,4-TETRAHYDRO-2-((4-(PHENYL)-1-PIPERAZINYL)-METHYL)-1-NAPHTHALENOLS AND DERIVATIVES AND ANALOGS THEREOF

B. Richard Vogt, Yardley, Pa., and David A. Cullison, Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 599,308, Jul. 25, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,411
Int. Cl.[2] A61K *31/495;* **C07D** *295/08*
U.S. Cl. 424—250 **13 Claims**

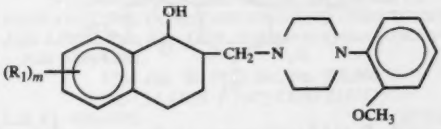
1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, hydroxy, alkanoyloxy, alkoxy, alkylthio, alkyl or trifluoromethyl, and m is 1 or 2 or R_1 is a single methylenedioxy group; R_3 is formyl or alkanoyl; wherein the terms "alkyl", "alkoxy" and "alkylthio" refer to groups having 1 to 10 carbon atoms; the term "alkanoyl" refers to groups having 2 to 10 carbon atoms; and the term "alkanoyloxy" refers to groups having 2 to 11 carbon atoms.

6. A composition useful for treating psychotic states in mammalian species which comprises a therapeutic amount of a compound as defined in claim 1 and a pharmaceutically acceptable carrier therefore.

7. A compound having the formula



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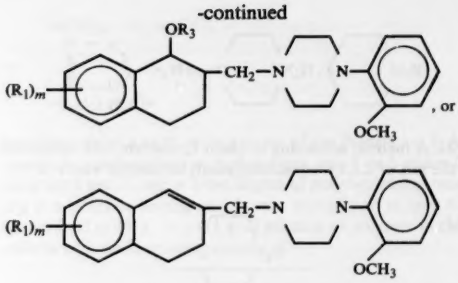


or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, hydroxy, alkanoyloxy, alkoxy, alkylthio, alkyl or trifluoromethyl, and m is 1 or 2 or R_1 is a single methylenedioxy group; R_3 is formyl or alkanoyl; wherein the terms "alkyl", "alkoxy" and "alkylthio" refer to groups having 1 to 10 carbon atoms; the term "alkanoyl" refers to groups having 2 to 10 carbon atoms; and the term "alkanoyloxy" refers to groups having 2 to 11 carbon atoms.

12. A composition useful for treating psychotic states in mammalian species which comprises a therapeutic amount of a compound as defined in claim 7 and a pharmaceutically acceptable carrier therefore.

4,130,647

METHODS FOR TREATING CONGESTIVE HEART FAILURE AND ISCHEMIC HEART DISEASE

Colin R. Taylor, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 8, 1977, Ser. No. 814,267
Int. Cl.[2] A61K *31/505*
U.S. Cl. 424—251 **6 Claims**

1. A method of treating congestive heart failure in a human subject having such condition which comprises orally or parenterally administering to said human subject a congestive heart failure treating amount of a compound selected from the group consisting of prazosin and trimazosin and the pharmaceutically acceptable acid addition salts thereof.

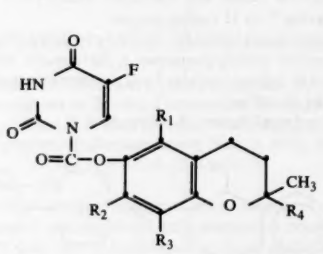
4,130,648

5-FLUOROURACIL DERIVATIVES AND ANTITUMOR PREPARATIONS CONTAINING THE SAME

Shizumasa Kijima, Tokyo; Hiroshi Shionoya, Saitama; Kimio Hamamura, Kashiwa; Haruyoshi Arai, Kokubunji, and Nozomu Koyanagi, Saitama, all of Japan, assignors to Eisai Co., Ltd., Japan

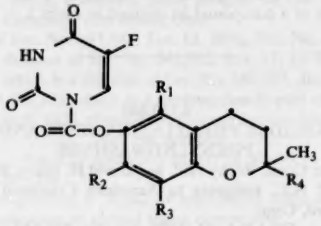
Filed Dec. 14, 1977, Ser. No. 860,319
Claims priority, application Japan, Dec. 24, 1976, 51-154941
Int. Cl.[2] A61K *31/505*; C07D *239/54*
U.S. Cl. 424—251 **10 Claims**

1. A 5-fluorouracil derivative represented by the general formula:



wherein R_1, R_2 and R_3 each represent hydrogen or methyl, and R_4 represents a straight or branched chain alkyl or alkenyl group.

10. An antitumor agent containing an effective anti-tumor amount of a 5-fluorouracil derivative represented by the general formula



wherein R_1, R_2 and R_3 each represent hydrogen or methyl, and R_4 represents a straight or branched chain alkyl or alkenyl group having 1–16 carbons and a pharmaceutically acceptable carrier therefor.

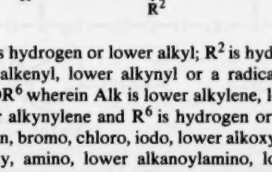
4,130,649

CYCLOPHETA [b]PYRIDINE-2-CARBOXYLIC ACID DERIVATIVES

Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Filed Apr. 21, 1977, Ser. No. 789,397
Int. Cl.[2] A61K *31/455*
U.S. Cl. 424—266 **37 Claims**

1. A compound of the formula



in which R^1 is hydrogen or lower alkyl; R^2 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl or a radical of formula —Alk—$COOR^6$ wherein Alk is lower alkylene, lower alkenylene or lower alkynylene and R^6 is hydrogen or lower alkyl; R^3 is hydrogen, bromo, chloro, iodo, lower alkoxy or phenoxy; R^4 is hydroxy, amino, lower alkanoylamino, lower alkoxy, lower alkenyloxy, lower alkynyloxy or a radical of formula —O—Alk—$COOR^6$ wherein Alk is lower alkylene, lower alkenylene or lower alkynylene and R^6 is hydrogen or lower alkyl; and R^5 is hydrogen, hydroxy, lower alkoxy or phenoxy; R^4 and R^5 together form a O—$C(CH_3)$=CH chain having the oxygen atom attached to the carbon atom bearing R^4; with the proviso that when R^1 is hydrogen then R^6 is hydrogen; or a therapeutically acceptable salt thereof.

36. A method for preventing or treating allergic conditions in a mammal which comprises administering to said mammal an effective allergy alleviating amount of a compound of claim 1, or a therapeutically acceptable salt thereof.

4,130,650
ANTIARRHYTHMIC METHOD OF USE

Erich Müller; Willi Diederen, both of Biberach, Germany, and Robin G. Shanks, Belfast, Northern Ireland, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

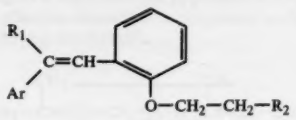
Filed May 25, 1977, Ser. No. 800,309

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624918

Int. Cl.[2] A61K *31/44*

U.S. Cl. 424—263 4 Claims

1. The method of alleviating cardiac arrhythmia in a warm-blooded animal, which comprises perorally or parenterally administering to said animal an effective antiarrhythmic amount of a compound of the formula



wherein

R_1 is hydrogen or methyl,

Ar is 2-pyridyl or 6-methyl-2-pyridyl, and

R_2 is dimethylamino or monomethylamino

or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

4,130,651
BUTAMISOLE INJECTABLE FORMULATIONS HAVING IMPROVED MARGIN OF SAFETY IN DOGS

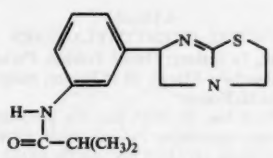
Larry D. Spicer, Princeton, and Karl L. Simkins, Jr., Princeton Junction, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 31, 1978, Ser. No. 892,001

Int. Cl.[2] A61K *31/425*

U.S. Cl. 424—270 17 Claims

1. A liquid anthelmintic composition for injection comprising an anthelmintically effective amount of a solution of a compound of formula:



the racemic mixtures, the optical isomers thereof as the pharmaceutically acceptable acid addition salts thereof in aqueous propylene glycol.

4,130,652
2-(IMINOETHYLIDENE)-PYRROLIDINES AND TAUTOMERIC 2-(AMINOETHENYL)-1-PYRROLINES

Atso Ilvespää, Allschwil, and Walter Fuhrer, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

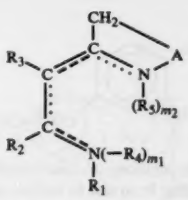
Filed Feb. 23, 1977, Ser. No. 771,294

Claims priority, application Switzerland, Feb. 27, 1976, 2441/76

Int. Cl.[2] A61K *31/40;* C09B *23/00*

U.S. Cl. 424—274 15 Claims

1. A compound of the formula I



(I)

wherein

R_1 represents an aliphatic or cycloaliphatic hydrocarbon radical having a maximum of 12 carbon atoms, phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen up to atomic number 35 and/or trifluoromethyl, or phenyl-lower alkyl or diphenyl-lower alkyl, which radicals are unsubstituted or substituted in the phenyl ring(s) as hereinbefore indicated for phenyl,

R_2 represents phenyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen up to atomic number 35 and/or trifluoromethyl,

R_3 represents hydrogen or lower alkyl,

R_4 represents, if present, lower alkyl,

R_5 represents, if present, hydrogen or lower alkyl,

A represents ethylene, and

m_1 and m_2 represent 0 or 1 and together always represent 1, and wherein two additional bonds, either corresponding to the dashed lines or corresponding to the dotted lines, are present, with m_1 representing 0 in the former case and m_2 representing 0 in the latter case, and its acid addition salts.

13. A method for the treatment of hyperglycaemia in a mammal comprising oral administration to said mammal of a hypoglycaemically effective amount of a compound according to claim 1 having the formula I defined in claim 1, or of a pharmaceutically acceptable acid addition salt thereof.

4,130,653
METHOD OF TREATING HYPERTENSION

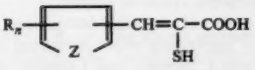
Eugene L. Giroux, Cincinnati, Ohio; Nellikunja J. Prakash, and Paul J. Schechter, both of Strasbourg, France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Mar. 31, 1978, Ser. No. 892,213

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 8 Claims

1. A method of treating hypertension in a patient in need thereof which comprises administering to said patient an antihypertensive effective amount of an α-mercapto-β-arylacrylic acid of the formula:



wherein Z is C═C, O, S or NH; R is H, CH_3, C_2H_5, OH, CH_3O, C_2H_5O, Cl, Br, F, I or CF_3; and n is 1, 2 or 3; or a pharmaceutically acceptable non-toxic salt thereof.

4,130,654
NOVEL 4-(8X-6,11-DIHYDRODIBENZO/[b.e.]-THIEPIN-11-ONE-3-YL)-4-OXOBUTYRIC ACIDS, METHODS OF PREPARATION, COMPOSITIONS AND USES THEREOF

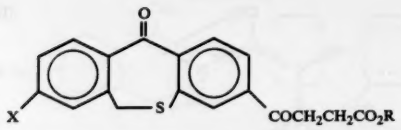
Jack Ackrell, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 30, 1978, Ser. No. 873,300

Int. Cl.[2] A61K *31/385;* C07D *337/12*

U.S. Cl. 424—275 19 Claims

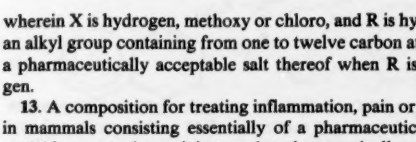
1. A compound of the formula:



(A)

wherein X is hydrogen, methoxy or chloro, and R is hydrogen, an alkyl group containing from one to twelve carbon atoms, or a pharmaceutically acceptable salt thereof when R is hydrogen.

13. A composition for treating inflammation, pain or pyrexia in mammals consisting essentially of a pharmaceutically acceptable non-toxic excipient and a therapeutically effective amount of a compound represented by the formula:



(A)

wherein X is hydrogen, methoxy or chloro, and R is hydrogen, an alkyl group containing from one to twelve carbon atoms, or a pharmaceutically acceptable salt thereof when R is hydrogen.

4,130,655

PESTICIDAL 2,2-DIMETHYL-3-ISOBUTYL-CYCLOPROPIONATES

Jozef Drabek, Allschwil; Saleem Farooq, Aesch; Laurenz Gsell, Füllinsdorf; Odd Kristiansen, Möhlin, and Willy Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

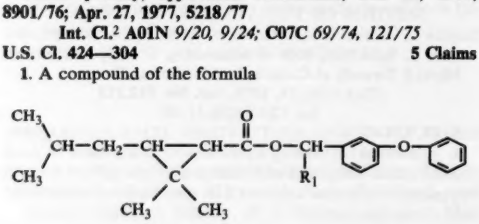
Filed Jul. 1, 1977, Ser. No. 812,088

Claims priority, application Switzerland, Jul. 12, 1976, 8901/76; Apr. 27, 1977, 5218/77

Int. Cl.[2] A01N *9/20, 9/24;* **C07C** *69/74, 121/75*

U.S. Cl. 424—304 **5 Claims**

1. A compound of the formula



wherein R_1 represents cyano or ethynyl.

4. An insecticidal and acaricidal composition comprising an insecticidally or acaricidally effective amount of a compound according to claim 1, together with a suitable carrier therefor.

4,130,656

PESTICIDAL 1-(PHENYL)-CYCLOBUTANE-1-CARBOXYLATES

Hans Greuter, Eiken; Pierre Martin, Basel; Daniel Bellus, Riehen; Laurenz Gsell, Füllinsdorf, and Willy Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

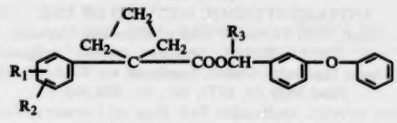
Filed Jul. 25, 1977, Ser. No. 818,899

Claims priority, application Switzerland, Jul. 29, 1976, 9737/76; Oct. 27, 1976, 13540/76; Apr. 29, 1977, 5370/77; Jun. 13, 1977, 7237/77

Int. Cl.[2] A01N *9/20, 9/24;* **C07C** *69/76, 121/75*

U.S. Cl. 424—304 **11 Claims**

1. A compound of the formula



wherein R_1 and R_2 each represent hydrogen, fluorine, chlorine, bromine or methyl, and R_3 represents hydrogen, cyano or ethynyl.

10. An insecticidal and acaricidal composition which comprises an insecticidally or acaricidally effective amount of a compound according to claim 1, together with a suitable carrier therefor.

4,130,657

[1,1'-BIPHENYL]-3-YLMETHYL 3-(2,2-DIHALOETHENYL)-2,2-DIMETHYLCYCLOPROPANECARBOXYLATES

Ernest L. Plummer, North Tonawanda, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 20, 1977, Ser. No. 844,099

Int. Cl.[2] C07C *69/74;* **A01N** *9/30*

U.S. Cl. 424—305 **10 Claims**

1. A [1,1'-Biphenyl]-3-ylmethyl 3-(2,2-dihaloethyenyl)-2,2-dimethylcyclopropanecarboxylate wherein the halogen is chlorine or bromine.

4,130,658

NOVEL PHENETHYLAMINES

Lucien Nédelec, Le Raincy; Daniel Fréchet, Paris, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

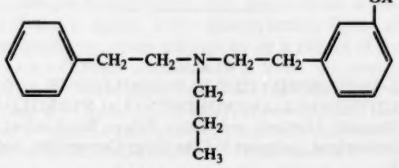
Filed Jun. 24, 1977, Ser. No. 809,810

Claims priority, application France, Jul. 1, 1976, 76 20140

Int. Cl.[2] A61K *31/135;* **C07C** *87/28, 69/02, 69/78*

U.S. Cl. 424—308 **21 Claims**

1. A compound selected from the group consisting of phenethylamines of the formula



wherein X is selected from the group consisting of hydrogen, acyl of an aliphatic carboxylic acid of 2 to 6 carbon atoms and benzoyl and Y is selected from the group consisting of hydrogen and —OX and their non-toxic, pharmaceutically acceptable acid addition salts.

4,130,659
POLYPRENYL CARBOXYLIC ACID COMPOUND AND HYPOTENSIVE AGENT CONTAINING IT AS ACTIVE INGREDIENT

Shizumasa Kijima, Tokyo; Toshiji Igarashi, Tokorozawa; Isao Yamatsu, Tokyo; Kimio Hamamura, Kashiwa; Yoshikage Nakajima, Tokyo; Norio Minami, Kawasaki; Youji Yamagishi, and Yuithi Inai, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

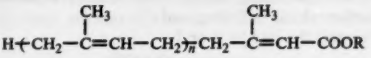
Division of Ser. No. 796,693, May 13, 1977, Pat. No. 4,107,193. This application May 8, 1978, Ser. No. 903,395

Claims priority, application Japan, May 27, 1976, 51-60583

Int. Cl.[2] A61K *31/23, 31/20*

U.S. Cl. 424—312 **10 Claims**

1. A method for treating hypertension which comprises administering to a warm-blooded hypertensive subject, a therapeutically effective amount of a polyprenyl carboxylic acid compound having the formula:



wherein R is selected from the group consisting of hydrogen, alkyl having 1 to 5 carbon atoms, alkenyl having 1 to 5 carbon atoms, cycloalkyl and aryl, and n is an integer of 6 to 11, together with a pharmaceutical carrier.

4,130,660
METHOD OF INHIBITING THE COMPLEMENT SYSTEM WITH TRISUBSTITUTED NAPHTHALENE COMPOUNDS

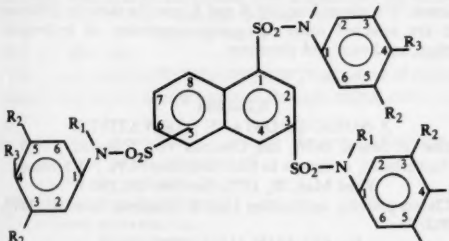
Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 782,212, Mar. 28, 1977, Pat. No. 4,087,613. This application Oct. 28, 1977, Ser. No. 846,489

Int. Cl.[2] A61K *31/195, 31/18*

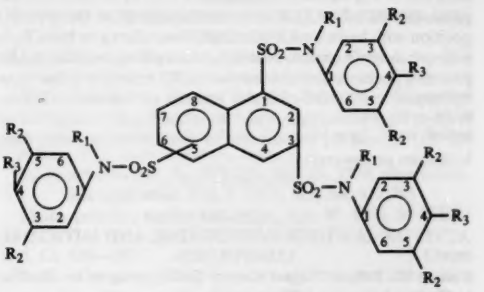
U.S. Cl. 424—319 **20 Claims**

1. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and methyl; R_2 is selected from the group consisting of hydrogen, carboxyl and $COOR_4$, wherein R_4 is selected from the group consisting of alkali metal and alkaline earth metal; R_3 is selected from the group consisting of hydrogen, hydroxy and $COOR_4$, wherein R_4 is as previously defined; with the proviso that each phenyl must contain at least one $COOR_4$; and the nontoxic pharmaceutically acceptable salts thereof.

11. A method of inhibiting the complement system in a warm-blooded animal which comprises internally administering to said animal an effective complement inhibiting amount of a compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and methyl; R_2 is selected from the group consisting of hydrogen, carboxyl and $COOR_4$, wherein R_4 is selected from the group consisting of alkali metal and alkaline earth metal; R_3 is selected from the group consisting of hydrogen, hydroxy and $COOR_4$, wherein R_4 is as previously defined; with the proviso that each phenyl must contain at least one $COOR_4$; and the non-toxic pharmaceutically acceptable salts thereof.

4,130,661
SUBSTITUTED BENZOYLACRYLANILIDES

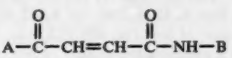
Peter Kulsa, Plainfield; Dale R. Hoff, Basking Ridge, and Helmut H. Mrozik, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 629,438, Nov. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 521,708, Nov. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 416,134, Nov. 15, 1973, abandoned. This application Jun. 30, 1977, Ser. No. 812,027

Int. Cl.[2] C01B *33/00;* **C07C** *103/22, 103/28, 103/38*

U.S. Cl. 424—324 **25 Claims**

19. A composition for the treatment of coccidiosis comprising an inert carrier and an anticoccidal amount of a compound of the formula:



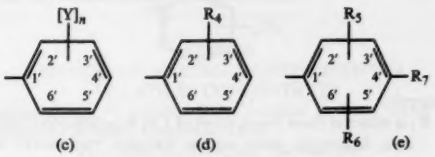
(I)

where A is:

(a)

where in formula (a) R_1, R_2 and R_3 are independently hydrogen, halo, loweralkylsulfide, loweralkylsulfonyl, loweralkyl, loweralkoxy, loweralkanoylamino or trihaloloweralkyl;

In formula I above, B represents:



(c) (d) (e)

where in formula (c), Y is halo and n is an integer of 4 to 5; in formula (d), R_4 is halo, loweralkyl, loweralkoxy, loweralkylsulfide or trihaloloweralkyl; and in formula (e) R_5 and R_6 are independently hydrogen, loweralkyl, loweralkoxy, trihaloloweralkyl or halo and R_7 is halo, loweralkyl or hydrogen, and at

least one of R_5, R_6 and R_7 being other than hydrogen with the provisos that when 1) A is mono-substituted at the para (4) position with hydrogen, loweralkyl, loweralkoxy or halo, R_4 is other than hydrogen, loweralkyl, loweralkoxy or halo at the para (4') position, and at least one of R_5 and R_6 is other than hydrogen; and 2) further that in formula (e) when R_5 is 2-loweralkyl, R_6 is 6-loweralkyl, and R_7 is hydrogen, at least one of the R_1, R_2 and R_3 substituents in formula (a) is other than hydrogen or loweralkyl.

4,130,662

ACYLFORMANIDINE INSECTICIDAL AND MITICIDAL COMPOUNDS

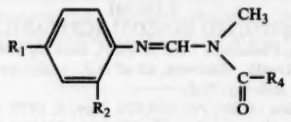
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 666,520, Mar. 12, 1976, Pat. No. 4,056,570, which is a division of Ser. No. 575,313, May 7, 1975, Pat. No. 3,962,305, which is a division of Ser. No. 439,507, Feb. 4, 1974, abandoned. This application Sep. 12, 1977, Ser. No. 834,256

Int. Cl.[2] A01N *9/20, 9/24*

U.S. Cl. 424—324 **6 Claims**

1. A method of controlling insects consisting of applying to said insects or the habitat thereof an insecticidally effective amount of a compound having the formula



wherein R_1 and R_2 are independently methyl or halogen and R_4 is either haloalkyl or ketoalkyl.

4,130,663

STYRYLAMIDINES

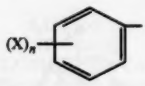
William L. Matier, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 825,996, Aug. 19, 1977, which is a division of Ser. No. 601,563, Aug. 4, 1975, Pat. No. 4,052,455, which is a continuation-in-part of Ser. No. 459,152, Apr. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,547, Jun. 11, 1973, abandoned. This application Apr. 10, 1978, Ser. No. 894,889

Int. Cl.[2] A61K *31/155*

U.S. Cl. 424—326 **10 Claims**

1. A method for preventing aggregation of blood platelets in a mammal having a thromboembolic condition which comprises administering to said mammal an antithrombogenic effective dose of a styrylamidine or a salt thereof of a pharmaceutically acceptable acid to provide a blood level of from 0.5 to 90 mcg. of said styrylamidine per 0.5 ml. blood, said styrylamidine being selected from the group consisting of the compounds having the formula



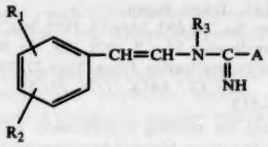
wherein

R_1 is selected from lower alkyl of 1 to 4 carbon atoms inclusive, hydrogen, nitro, amino, halogen, cyclohexyl, carbamoyl, lower alkylsulfonyl from 1 to 4 carbon atoms inclusive, sulfamoyl or lower alkanoylamido of from 2 to 4 carbon atoms inclusive;

R_2 is selected from hydrogen or halogen with the proviso that when R_1 is halogen, R_2 can represent up to two additional halogen;

R_3 is hydrogen, cyclopropyl or lower alkyl of 1 to 4 carbon atoms inclusive;

A is selected from lower alkyl of from 1 to 8 carbon atoms inclusive, di(lower)alkylaminophenyl, phenyl, benzyl, β-naphthyl, styryl, phenylbutadienyl, cycloalkyl of 3 to 6 carbon atoms inclusive, or a substituted phenyl radical represented by the symbol



wherein

X is selected from (lower) alkoxy from 1 to 4 carbon atoms inclusive, halogen, nitro, amino, lower alkanoylamido of from 2 to 4 carbon atoms inclusive, and

n represents the integer 1 or 2.

4,130,664

BIS(DIPHENYLAMINOMETHANE) ANTIMICROBIAL AGENTS

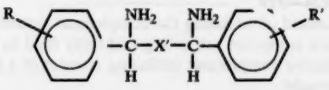
Bogislav von Schmeling, Hamden, Conn., and Walter R. Boos, Guelph, Canada, assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Ontario, Canada

Division of Ser. No. 658,004, Feb. 13, 1976, Pat. No. 4,044,139, which is a division of Ser. No. 440,941, Feb. 8, 1974, Pat. No. 3,954,868, which is a division of Ser. No. 231,385, Mar. 2, 1972, Pat. No. 3,808,316. This application Jun. 15, 1977, Ser. No. 806,650

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—330 **8 Claims**

1. A method of controlling bacteria or fungi which comprises applying, to a locus subject to attack by said bacteria or fungi, a bactericidally or fungicidally effective amount of a compound of the formula:



wherein X' is phenylene and R and R' are the same or different and are selected from the group consisting of hydrogen, methyl, methoxy, and phenoxy.

4,130,665

A-NORANDROSTANE DERIVATIVES

Arthur F. Marx, Delft, and Cornelis Vos, Pijnacker, both of Netherlands, assignors to Gist-Brocades N.V., Netherlands

Filed Mar. 28, 1978, Ser. No. 891,288

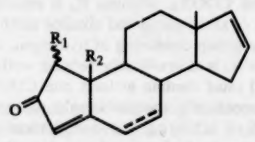
Claims priority, application United Kingdom, Mar. 28, 1977, 13003/77

Int. Cl.[2] A61K *31/12;* **C07C** *49/46*

U.S. Cl. 424—331 **7 Claims**

1. A-nor-androsta-3(5),16-dien-2-one derivatives of the formula:

I



wherein R_1 and R_2 are the same or different and each represents a hydrogen atom or a methyl group, the dotted line in the

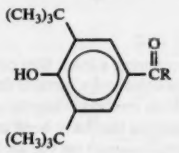
6-7 position indicates the optional presence of an additional double bond and the wavy line in the 1 position indicates that the substituent R_1 is either in α- or β-configuration.

4,130,666
ANTI-INFLAMMATORY METHOD

George G. I. Moore, Birchwood, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Continuation of Ser. No. 797,138, May 16, 1977, abandoned.
This application Apr. 6, 1978, Ser. No. 894,101
Int. Cl.[2] A61K *31/12*
U.S. Cl. 424—331 7 Claims

1. A method for combatting inflammatory processes in a mammal which comprises administering an effective dose less than the toxic amount of a compound of the formula:



wherein R is cycloalkyl of 3 to 6 carbon atoms, ethyl, n-propyl or n-butyl to said mammal.

4,130,667
DERMATOLOGICAL COMPOSITIONS

Donald E. Smith, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 647,943, Jan. 12, 1976, Pat. No. 4,046,886, which is a division of Ser. No. 541,902, Jan. 17, 1975, Pat. No. 3,925,099, which is a division of Ser. No. 340,787, Jul. 22, 1975, Pat. No. 3,896,238, which is a continuation-in-part of Ser. No. 241,404, Apr. 5, 1972, abandoned. This application Jun. 13, 1977, Ser. No. 805,667
Int. Cl.[2] A61K *47/00*
U.S. Cl. 424—361 1 Claim

1. A composition for enhancing the penetration of pharmacologically active agents into and through animal tissue comprising:

(1) at least about 0.1% by weight of a sugar ester selected from the group consisting of
sucrose monooctanoate,
sucose monodecanoate,
sucrose monolaurate,
sucrose monomyristate,
sucrose monopalmitate,
sucrose monostearate,
sucrose monooleate, and
sucrose dioleate; and

(2) at least about 0.1% by weight of a phosphine oxide compound selected from the group consisting of
octyl dimethyl phosphine oxide,
nonyl dimethyl phosphine oxide,
decyl dimethyl phosphine oxide,
undecyl dimethyl phosphine oxide,
dodecyl dimethyl phosphine oxide,
2-hydroxydecyl dimethyl phosphine oxide,
2-hydroxyundecyl dimethyl phosphine oxide, and
2-hydroxydodecyl dimethyl phosphine oxide.

4,130,668
METHOD FOR CHEMICALLY PEELING FRUITS AND VEGETABLES

Shigeru Otsuka, Toyonaka; Zenichi Mōri, Wakayama; Tetsuhiko Tominaga, Takarazuka; Junichi Tamura, Wakayama; Yoshio Shimoda, Ikeda; Takashi Takeuchi, Wakayama; Masakazu Oku, Hyogo, and Kan Mori, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd. and Toyo Seikan Kaisha, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 679,018, Apr. 21, 1976, abandoned.
This application Aug. 8, 1977, Ser. No. 822,705
Claims priority, application Japan, Apr. 30, 1975, 50-52192
Int. Cl.[2] A23L *1/212*
U.S. Cl. 426—287 9 Claims

1. A method for peeling fruits or vegetables, which consists essentially of the step of: immersing the fruit or vegetable in an aqueous alkaline solution having a temperature in the range of from room temperature to 90° C., for a time period of from 1 to 30 minutes, said aqueous alkaline solution consisting essentially of

I. from 0.1 to 1.5 weight percent of alkali,

II. from 0.005 to 1.0 weight percent of a mixture of

(a) polyoxyethylene (3–60) sorbitan fatty acid (C_8–C_{18}) ester having an HLB value higher than 9, and

(b) glycerine fatty acid (C_8–C_{18}) ester having an HLB value not higher than 9, said mixture containing from one to 5 parts by weight of component (a) and from one to 5 parts by weight of component (b) and

III. The balance being essentially water.

4. A method for peeling fruits or vegetables, which consists essentially of the step of: immersing the fruit or vegetable in an aqueous alkaline solution having a temperature in the range of from room temperature to 90° C., for a time period of from one to 30 minutes, said aqueous alkaline solution consisting essentially of

I. from 0.1 to 1.5 weight percent of alkali,

II. from 0.005 to 1.0 weight percent of a mixture of

(a) polyoxyethylene (3–60) sorbitan fatty acid (C_8–C_{18}) ester having an HLB value higher than 9, and

(b) sorbitan fatty acid (C_8–C_{18}) ester having an HLB value not higher than 9, said mixture containing from one to 5 parts by weight of component (a) and from one to 5 parts by weight of component (b) and

III. the balance being essentially water.

7. A method for peeling fruits or vegetables, which consists essentially of the step of: immersing the fruit or vegetable in an aqueous alkaline solution having a temperature in the range of from room temperature to 90° C., for a time period of from one to 30 minutes, said aqueous alkaline solution consisting essentially of

I. from 0.1 to 1.5 weight percent of alkali,

II. from 0.005 to 1.0 weight percent of a mixture of

(a) polyoxyethylene (3–60) sorbitan fatty acid (C_8–C_{18}) ester having an HLB value higher than 9, and

(b) propylene glycol fatty acid (C_8–C_{18}) ester having an HLB value not higher than 9, said mixture containing from one to 5 parts by weight of component (a) and from one to 5 parts by weight of component (b) and

III. the balance being essentially water.

4,130,669
METHOD OF MAKING AN IMPROVED TEA VOLATILES CONCENTRATE

Richard Gregg, Greenhills, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 22, 1977, Ser. No. 808,759
Int. Cl.[2] A23F *3/00*
U.S. Cl. 426—385 7 Claims

1. A method for preparing a tea volatiles concentrate from ground tea leaves comprising the steps of:

(a) uniformly wetting said ground tea with from about 0.1 to about 3.0 parts water per part of ground tea, said water

being at a temperature of from about 32° F. to about 160° F.;

(b) contacting said ground tea while, in a state of fluidization in free space, with from about 0.005 to about 0.20 parts steam, per part of ground tea, thereby to provide volatiles-laden steam and devolatilized ground tea; said contact being conducted under an absolute pressure of from about 5 to about 250 mm of mercury, the steam having a temperature of from about 32° F. to about 160° F., said ground tea making contact with said steam for about 0.1 to about 45 minutes;

(c) collecting the volatiles-laden steam as a frost by freeze condensation at a temperature of from about −100° F. to about −320° F. and at an absolute pressure of from about 0 to about 80 mm of mercury;

(d) melting the frost to form a tea volatiles concentrate by contacting the frost with at least an equal weight of an aqueous tea extract having a solids content of from about 15% to about 65%; and wherein said fluidization is mechanically induced within a horizontal mixing shell by mixing tools which rotate within said shell at high speeds sufficient to impart rapid hurling-and-whirling motion to the ground tea leaves, said mixing tools being so designed such as to lift, drop and push the ground tea leaves from the walls of said shell into free space so that intimate steam contact takes place without adverse effect on said ground tea leaves.

4,130,670
PROCESS FOR FIXING TONER IMAGES

Yvan K. Gilliams, Hever; Walter F. De Winter, 's-Grevenwezel; August J. Van Paesschen, Antwerp, and Daniël M. Timmerman, Mortsel, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Sep. 14, 1976, Ser. No. 723,189

Claims priority, application United Kingdom, Sep. 16, 1975, 38070/75

Int. Cl.² G03G *13/20*

U.S. Cl. 427—16 **15 Claims**

1. A process for electrophoretically depositing and fixing an electrophoretic toner particle image on a sheet or web material comprising a support and permanently adhered to said support a fixing layer of a thermo-adhesive defining the surface of said material on which said toner image particles are deposited, said process comprising the steps of passing said material with an electrostatic charge pattern carried in said thermo-adhesive fixing layer through an electrophoretic developing liquid comprising finely divided resin-coated pigment particles suspended in an insulating carrier liquid to imagewise deposit said particles on said fixing layer, said resin-coated particles being adapted to form with said thermo-adhesive when the latter is in melted condition a contact angle smaller than 90° so that said particles will be wet by molten thermo-adhesive and heating for a time not longer than about 20 seconds to a temperature which is above 90° C at least those parts of such layer corresponding with the toner image but below a temperature at which permanent deformation of the sheet or web material occurs, said heating being of a sufficient intensity as to melt said thermo-adhesive and maintain the same melted until said particles sink into embedded relation within the melted fixing layer in the absence of applied mechanical pressure, and allowing said imaged layer to cool and solidify with said image particles embedded in said layer, said thermo-adhesive fixing layer comprising an organic polymeric material, having a surface resistance above 10^{10} Ohm/square, freedom from blocking at least up to 35° C, a melt viscosity at 190° C of not more than 120 P and an abrasion resistance at 20° C above 175 g, said blocking, abrasion resistance, melt viscosity and contact angle values being determined according to the respective "standard tests" described in the specification.

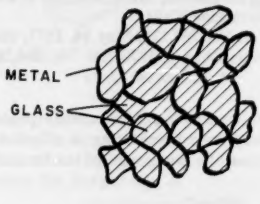
4,130,671
METHOD FOR PREPARING A THICK FILM CONDUCTOR

Voddarahalli K. Nagesh, Berkeley, Calif., and Richard M. Fulrath, deceased, late of Berkeley, Calif. (by Marilyn M. Fulrath, executrix), assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 30, 1977, Ser. No. 838,273

Int. Cl.² B05D *5/12*; C03C *17/06, 15/00*

U.S. Cl. 427—125 **17 Claims**



1. A method for preparing a thick film conductor wherein a composite of glass particles and a metal is formed on an insulator base material, which method comprises:

providing glass particles that have been surface activated by hydrogen ion emplacement on the surface thereof;

mixing the surface active glass particles with an amount of a thermally decomposable organo-compound of the metal sufficient to provide a metal content of at least about 20 weight percent in the glass-metal composite;

applying the surface active glass particle mixture to an insulator base material;

decomposing the organometallic compound by heating, thereby chemically depositing metal particles on the glass particles; and

heating the resulting system in an oxidizing atmosphere under conditions to provide a thick film conductor, said conductor consisting essentially of the insulator base material having formed thereon a glass-metal composite having a microstructure of glass particles surrounded by an interconnecting metallic film chemically bonded to the glass particles at the glass-metal interface;

the resulting thick film conductor having a sheet resistivity of less than about 230 milliohms per square.

4,130,672
METHOD FOR COATING ANTI-REFLECTION FILM ON SURFACE OF OPTICAL MATERIAL

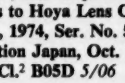
Fumio Onoki, Tokorozawa, and Hajime Kamiya, Kokubunji, both of Japan, assignors to Hoya Lens Co., Ltd., Japan

Filed Sep. 11, 1974, Ser. No. 504,977

Claims priority, application Japan, Oct. 16, 1973, 48-116117

Int. Cl.² B05D *5/06*

U.S. Cl. 427—164 **2 Claims**



1. A method for coating an anti-reflection film on the surface of an optical material, comprising

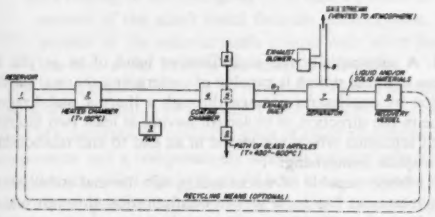
a first step of vacuum-depositing under a first condition of vacuum-deposited a silicon oxide SiO film having a predetermined thickness on said surface of said optical material while said optical material is placed in a vacuum chamber having a first vacuum degree and kept at temperatures below 120° C. at which the quality and the shape of said material are not changed, and

a second step of vacuum-depositing under a second condition of vacuum-deposition different from said first condition a silicon dioxide SiO_2 film having a predetermined thickness on said SiO film while the temperature of said optical material is kept the same as in said first step but said first vacuum degree is changed to a second vacuum degree different from said first vacuum degree.

4,130,673
PROCESS OF APPLYING TIN OXIDE ON GLASS USING BUTYLTIN TRICHLORIDE

William A. Larkin, Morristown, N.J., assignor to M&T Chemicals Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 592,474, Jul. 2, 1975, abandoned, which is a division of Ser. No. 507,074, Sep. 18, 1974. This application Jan. 27, 1978, Ser. No. 872,765
Int. Cl.[2] C03C *17/32, 17/10*
U.S. Cl. 427—255 2 Claims



1. A method for reducing the coefficient of friction and susceptibility to scratching exhibited by glass surfaces, the method consisting essentially of the following sequence of operations:

(1) Maintaining said glass surface at a temperature of between 450 and 600° C. while applying to said glass surface vaporized or finely divided butyltin trichloride,

(2) Maintaining the glass surface at a temperature of 350° C. or below while applying to the glass surface a coating of a natural wax or synthetic polymer.

4,130,674
PROCESS OF CONTROLLING ORGANIC COATINGS IN AQUEOUS SPRAY BOOTH SYSTEMS

Wilbert J. Roberts, Plymouth, and Gerald R. Weissman, Southfield, both of Mich., assignors to Detrex Chemical Industries, Inc., Detroit, Mich.

Filed Aug. 17, 1977, Ser. No. 825,328
Int. Cl.[2] B05D *1/40, 1/02*
U.S. Cl. 427—331 10 Claims

1. In a process for controlling the overspray of organic coatings in an aqueous spray booth system, the improvement which comprises the step of adding to the water supply of an aqueous spray booth system adapted to remove the overspray of organic coatings, an effective amount of a mixture of (1) a long carbon chain surface active nitrogen derivative containing one or more hydrocarbon chains of about C_8 to C_{18} in length and (2) at least one member selected from the class consisting of (a) a polyvalent water soluble or dispersible metal salt of a metal selected from the class consisting of calcium, iron, zinc, barium, magnesium, strontium and aluminum, and (b) a nonionic or anionic high molecular weight polymer selected from the class consisting of homopolymers, copolymers or terpolymers of acrylic acid, acrylamide, acrylonitrile, polyhydroxy-alcohols, polyamines, polytetraethylenediamine, vegetable gums, polyisocyanates, polyglycidyl and aldehydes, or a blend of said polymers, whereby any organic coating over-sprayed into said water supply becomes removable therefrom as a non-sticky, non-tacky, readily handled sludge.

4,130,675
POLYARYLENE SULFIDE RESIN COATING METHOD

Eustathios Vassiliou, Newark, Del., and Edward J. Welch, Springfield, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 666,055, Mar. 11, 1976. This application Nov. 28, 1977, Ser. No. 855,416
Int. Cl.[2] B05D *1/36, 3/02*
U.S. Cl. 427—333 3 Claims

1. A process for producing light colored coatings of polyarylene sulfide resin which are produced by polyarylene sulfide resin coating compositions; the process comprising

(a) placing upon a substrate a modifying compound which is a citrate, carbonate, sulfate or hydroxide of sodium, potassium, rubidium, or cesium;

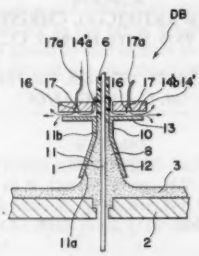
(b) overcoating with a polyarylene sulfide resin composition; and then

(c) heating until the polyarylene sulfide resin is fused.

4,130,676
COATING APPARATUS AND METHOD

Takashi Ichiyanagi; Takashige Akiyama, both of Hirakata, and Ichizo Otoda, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 14, 1977, Ser. No. 777,549
Int. Cl.[2] B05C *3/02;* B44D *1/42*
U.S. Cl. 427—358 8 Claims



8. A method for applying a coating solution onto a material to be coated by employing a coating apparatus which includes a floating die member having an opening therethrough, said opening gradually narrowing in the direction of advance of said material to be coated, and a thrust bearing member having an opening therein and lubricating means for reducing friction in the radial direction thereof between said floating die member and said thrust bearing and extending in a direction normal to the advancing direction of said material to be coated, said opening of said thrust bearing member being aligned with said opening in said floating die member, said coating solution applying method comprising the steps of passing the material to be coated upwardly through the coating solution and then through said opening in said floating die member for causing the die member to float on the coating solution drawn upwardly by the material to be coated and for removing excess coating solution and subsequently passing said material to be coated through said opening in said thrust bearing member for improving the follow-up performance of said floating die member with respect to lateral movement of said material to be coated as it is advancing through said floating die member and said thrust bearing member for formation of coating film of the coating solution having a uniform thickness on said material to be coated.

4,130,677

PROCESS FOR APPLYING TO GLASS AN ORGANIC COATING HAVING CONTROLLED BOND STRENGTH

James R. Huntsberger, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 21, 1977, Ser. No. 844,519
Int. Cl.[2] B05D *1/36, 1/38*
U.S. Cl. 427—379 12 Claims

1. A process for applying to glass a coating capable of delamination and stretching upon impact resulting in glass breakage, said process comprising:

(1) applying to a glass surface free from materials which are non-dispersible in water a two-component coating which contains as one component γ-aminopropyltriethoxysilane that bonds directly to the glass, and as the other component polyethylene having an average molecular weight within the range of approximately 1000 to 2000 in an amount such that the γ-aminopropyltriethoxysilane/-polyethylene layer will be about 0.05–0.25 μm thick when dry, the proportion of γ-aminopropyltriethoxysilane being approximately 5–30% based on the weight of the polyethylene;

(2) drying the coating applied in step (1);

(3) applying to the above dry coating a second coating of a copolymer of an α-olefin having 3–10 carbon atoms and of an α,β-unsaturated carboxylic acid having 3–8 carbon atoms, the mole proportion of the carboxylic acid being about 0.2–5% of the total monomers; and

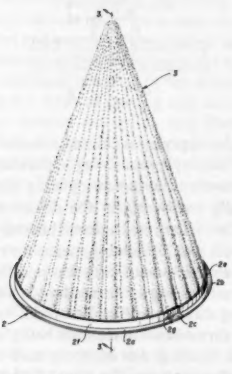
(4) heating the coating to a sufficiently high temperature to form a continuous film; the amount of the copolymer being such that the dry copolymer film is about 0.07–0.40 mm thick.

4,130,678

COLLAPSIBLE ARTIFICIAL CHRISTMAS TREE

James R. Higgins, 9516 Ferry Harbour Ct., Alexandria, Va. 22309

Filed Oct. 21, 1976, Ser. No. 734,555
Int. Cl.[2] A47G *33/06*
U.S. Cl. 428—9 9 Claims



1. A collapsible artificial Christmas tree comprising, a base, one end of a telescopic mast being connected to said base, garland means extending between the base and the opposite end of the mast to form a generally conically-shaped configuration; said base comprising a plurality of panel members, and hinge means interconnecting said panel members, whereby in the erected position the panel members are disposed in a substantially horizontal plane to support the tree, and in the collapsed position certain panel members are foldable to a substantially vertical plane to thereby form a storage compartment for the collapsed tree, and wall means connected to said panel members in proximity to the edges thereof to thereby provide a gallery for the base when in the erected position, and a wall of the storage compartment when the panels are in the folded position.

4,130,679

SPLICE FOR USE DURING THE THERMAL STABILIZATION OF A FLAT MULTIFILAMENT BAND OF AN ACRYLIC FIBROUS MATERIAL COMPRISING AT LEAST TWO SEGMENTS

Robert A. Breznak, Clifton, and James A. Parker, Somerville, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 641,066, Dec. 15, 1975, Pat. No. 4,048,277.
This application Apr. 25, 1977, Ser. No. 790,540
Int. Cl.[2] B32B *7/08*
U.S. Cl. 428—58 6 Claims

1. A substantially flat multifilament band of an acrylic fibrous material which is capable of undergoing thermal stabilization by continuous passage through a thermal stabilization zone in the direction of its length having at least two discrete band segments which are joined in an end to end relationship by a splice comprising:

(1) fabric capable of withstanding the thermal stabilization treatment having a weave configuration through which heat of reaction is permitted to dissipate which surrounds an end of each band segment and extends beyond the end of said band segment to form a substantially flat fabric extension,

(2) stitches capable of withstanding the thermal stabilization treatment which join said fabric to the end of each band segment, and

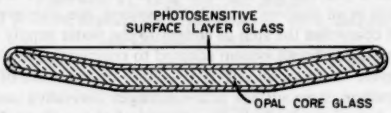
(3) stitches capable of withstanding the thermal stabilization treatment which unite a pair of said substantially flat fabric extensions while in an overlapping opposing relationship in the absence of any substantial overlap of the acrylic fibrous material of each band segment within said splice.

4,130,680

STRONG, LIGHTWEIGHT PHOTOSENSITIVE LAMINATE

Joseph Ference, and John E. Megles, Jr., both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,879
Int. Cl.[2] C03C *3/26;* B32B *17/00*
U.S. Cl. 428—68 8 Claims



1. An integrally colored laminated glass article consisting of a tensilely stressed core layer composed of a spontaneous opal core glass of alkali aluminosilicate composition and a compressively stressed surface layer fused to and substantially enveloping said core layer composed of a surface layer glass having at least one integrally colored region containing microcrystals of alkali metal fluoride and a coloring metallic silver phase, wherein:

(a) the ratio of the thickness of said core layer to the thickness of said surface layer is at least about 8:1;

(b) the thickness of said surface layer is at least about 0.002 inches;

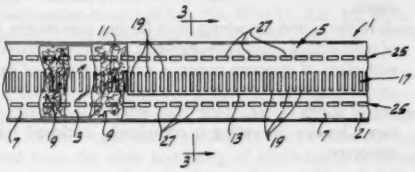
(c) the core glass has an average linear coefficient of thermal expansion (0°–300° C.) of at least about 75×10^{-7}/° C.;
(d) the surface layer glass has an average linear coefficient of thermal expansion (0°–300° C.) which is at least 10×10^{-7}/° C. less than that of the core glass;
(e) the surface layer glass contains at least about 0.01% silver by weight;
(f) the core glass is essentially free of Li_2O; and
(g) the integrally colored region of the surface layer glass contains microcrystals of alkali metal fluoride in a concentration of at least 0.005% by volume and further contains:
(i) discrete colloidal particles of metallic silver less than about 200A in the smallest dimension and/or
(ii) metallic silver contained within at least a part of said alkali metal fluoride microcrystals, said silver-containing part of the microcrystals being less than about 200A in the smallest dimension and/or
(iii) a coating of metallic silver on at least a portion of the surface of the alkali metal fluoride microcrystals, the portion of the microcrystals coated with silver being less than about 200A in the smallest dimension.

5. A method for producing an integrally colored laminated glass article consisting of a tensilely stressed core layer composed of a spontaneous opal core glass of alkali aluminosilicate composition and a compressively stressed surface layer fused to and substantially enveloping said core layer composed of a surface layer glass having at least one integrally colored region containing microcrystals of alakli metal fluoride and a coloring metallic silver phase, which method comprises the steps of:
(a) providing a first melt of an alkali aluminosilicate core glass having an average linear coefficient of thermal expansion (0°–300° C.) of at least about 75×10^{-7}/° C. and a composition which is essentially free of Li_2O, the viscosity of said first melt being in the range of about 400–4000 poises;
(b) providing a second melt of a photosensitive surface layer glass having an average linear coefficient of thermal expansion (0°–300° C.) which is at least about 10×10^{-7}/° C. less than that of the core glass and a composition which includes at least about 0.01% silver by weight, the viscosity of said second melt being in the range of about 700–3000 poises;
(c) combining the first and second melts into laminated glass sheet and shaping the sheet to provide a laminated glass article comprising a core layer and a photosensitive surface layer, the ratio of the thickness of the core layer to the thickness of the surface layer being at least about 8:1 and the thickness of the surface layer being at least about 0.002 inches;
(d) developing selected regions of the photosensitive surface layer into integrally colored regions, said regions containing microcrystals of alkali metal fluoride in a concentration of at least about 0.005% by volume and further containing:
(i) discrete colloidal particles of metallic silver less than about 200A in the smallest dimension and/or
(ii) metallic silver contained in at least part of said alkali metal fluoride microcrystals, said silver-containing part of the microcrystals being less than about 200A in the smallest dimension and/or
(iii) a coating of metallic silver on at least a portion of the surface of the alkali metal fluoride microcrystals, the portion of the microcrystals coated with silver being less than about 200A in the smallest dimension.

4,130,681
STRAPPING FOR ORTHODONTIC HEADGEAR AND OTHER USES

Irvin S. DeWoskin, St. Louis, Mo., assignor to Orthoband Company, Inc., Barnhart, Mo.

Filed Jan. 10, 1977, Ser. No. 757,914
Int. Cl.[2] B32B *3/06, 9/00;* A61C *3/00*
U.S. Cl. 428—102 6 Claims

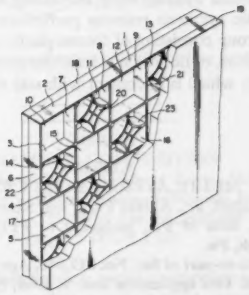


1. Strapping for orthodontic headgear or other uses comprising a core constituted by a strip of substantially nonstretchable thermoplastic plastic material and a wrapper for the core constituted by a composite strip comprising a layer of thermoplastic film and a layer of thermoplastic padding material bonded to the film, said composite strip being wrapped around the side edges of the core with the layer of film on the outside and the layer of padding material on the inside and having its marginal edges overlapped on one face of the core along the length of the strapping, said overlapping edges being stitched together to form a longitudinal overlap seam for the composite strip by a series of discrete thermoplastic stitches, said series extending longitudinally of the strip and generally centrally of the strip, said stitches being relatively closely spaced longitudinally of the strapping and penetrating through the strapping from one face thereof to the other, whereby the wrapper is thermoplastically sealed by said stitches to the core at opposite faces of the core as well as being thermoplastically longitudinally seamed.

4,130,682
SOUND ABSORBING DEVICE

John W. Lauko, 33 N. Center, Perry, N.Y. 14530

Filed Mar. 24, 1978, Ser. No. 889,820
Int. Cl.[2] B32B *3/12, 3/10;* E04B *1/99*
U.S. Cl. 428—116 1 Claim



1. A sound absorbing device, comprising
a lattice-type structure having a plurality of equidistantly spaced parallel horizontal strips and a plurality of equidistantly spaced parallel vertical strips intersecting the horizontal strips at right angles to form a matrix structure having a plurality of substantially square open compartments each bordered by a pair of spaced parallel horizontal strip segments and a pair of spaced parallel vertical strip segments,

a plurality of sound absorbing units in alternate compartments of the structure each of the sound absorbing units comprising four concave strip segments each extending from the midpoint of a corresponding one of the strip segments of a corresponding one of the compartments to the midpoint of a corresponding other of the strip segments of the corresponding one of the compartments to form a concave-sided square in said one of said compartments rotated 90° relative to said one of said compartments,

each of the sound absorbing units further comprising a pair of intersecting cross strip segments extending between the midpoints of opposite concave strip segments of its concave sides, and

a pair of sheets covering the open sides of the matrix structure, thereby providing a completely enclosed integral structure.

4,130,683

SPONGE-LIKE MATERIAL HAVING IMPROVED SCRUBBING AND CLEANING ABILITY

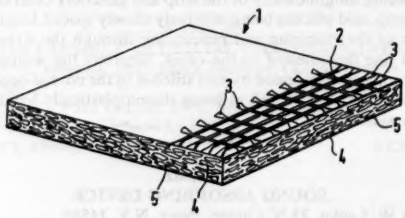
Wolfgang Michel, Wiesbaden, and Heinz Kälberger, Oberwalluf, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 15, 1978, Ser. No. 886,818

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711698

Int. Cl.² B32B *3/02*

U.S. Cl. 428—194 **16 Claims**



1. A porous sponge-like material suitable for use in cleaning comprising a porous cellulose hydrate body having at least one netting attached to at least a portion of the surface thereof, said porous cellulose hydrate body containing a filler material of thermoplastic synthetic resinous particulate material selected from the group consisting of thermoplastic synthetic resinous powders, fibers, or fibrids on at least that portion of the surface of said body which is in contact with said netting.

4,130,684

MULTILAYERED SAFETY GLASS

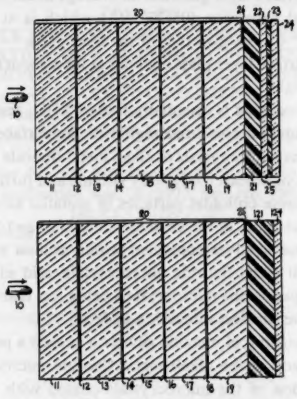
Harry E. Littell, Jr., Allison Park, and Shorr, Norman, Mount Lebanon, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 819,045, Apr. 24, 1969, Pat. No. 3,864,204. This application Jun. 9, 1969, Ser. No. 831,286

Int. Cl.² B32B *7/02*; F41H *5/26*

U.S. Cl. 428—212 **6 Claims**

1. In a multilayered safety glass laminate comprising a plurality of alternate plies of glass and plasticized polyvinyl butyral resin arranged to provide an impact striking section, a transition section and an impact absorption section, the improvement comprising a plurality of plies of said resin in said impact striking section having a relatively low plasticizer content equivalent to less than 25 parts by weight of triethylene glycol di-(2-ethyl butyrate) per 100 parts of said resin and said transition section comprising said plasticized polyvinyl butyral resin having a relatively high plasticizer content equivalent to more than 35 parts by weight of triethylene glycol di-(2-ethyl butyrate) per 100 parts of said resin.



4,130,685

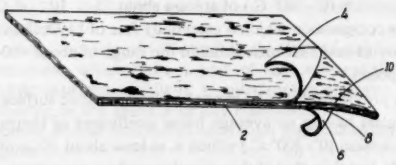
CORK WALL COVERING

John A. Tarullo, 4700 Robards La., Louisville, Ky. 40218

Filed Sep. 20, 1974, Ser. No. 507,725

Int. Cl.² B32B *21/08, 27/30, 27/36*

U.S. Cl. 428—247 **6 Claims**



1. A cork wall covering comprising a sheet of cork material of from about 0.006 to 0.040 inches in thickness adhesively secured to one side to a backing material of from about 0.005 to 0.008 inches in thickness by a first adhesive and having on the opposite side thereof a facing material of from about 0.005 to 0.010 inches in thickness adhesively secured thereto with a second adhesive, said backing material being cloth or paper, said facing material being a vinyl film, said first adhesive being a thermoplastic adhesive and said second adhesive being a cured polyester resin.

4,130,686

STRAPPING BAND HAVING CORE FORMED FROM A THERMOSETTING RESIN AND A COVERING FORMED FROM A THERMOPLASTIC RESIN

Mitsuhiro Takahashi, Yokohama; Tadao Senoo, Hino; Shigeo Minekawa, Minokamo, and Toshiharu Hirai, Gifu, all of Japan, assignors to Ube-Nitto Kasei Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1977, Ser. No. 803,306

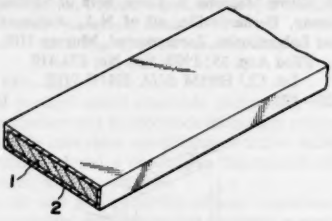
Claims priority, application Japan, Jun. 17, 1976, 51/78202[U]

Int. Cl.² B65D *63/10*

U.S. Cl. 428—294 **8 Claims**

1. A strapping band comprising a tape-shaped core having continuous reinforcing fibers combined together with a thermosetting resin, and an outer layer of thermoplastic resin covering said tape-shaped core, wherein said thermoplastic resin

and said thermosetting resin each has polymeric units derived from the same monomer.



4. A strapping band as claimed in claim 1, wherein said reinforcing fibers are several continuous glass rovings arranged in parallel with each other.

4,130,687

INORGANIC FOAM

Denis G. H. Ballard; Colin S. Cundy, and Graham R. Rideal, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 14, 1977, Ser. No. 787,377
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—310 **27 Claims**

1. A rigid foam comprising an inorganic cellular structure composed of lamellae of vermiculite.

25. A polyurethane foam panel faced on at least one side with a coating of the foam as claimed in claim 1.

4,130,688

ELECTROCONDUCTIVE RESINS AND INTERMEDIATES AND ELECTROCONDUCTIVE COATED PAPER

Joseph L. Garner, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

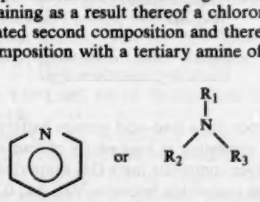
Division of Ser. No. 668,335, Mar. 19, 1976, Pat. No. 4,071,666. This application Jan. 3, 1978, Ser. No. 868,095
Int. Cl.[2] C08K *5/03*
U.S. Cl. 428—342 **9 Claims**

1. A process for producing an electroconductive coated paper comprising coating a copying paper base with about 0.1 to about 3 pounds of an electroconductive composition per 3,000 square feet per side of the copying paper base said electroconductive composition having been prepared by chloromethylating or bromomethylating a first composition which comprises, by weight,

Component (A) from about 85 to about 95 parts of a polystyrene characterized by a weight average molecular weight, $\overline{M}_w$, of about 5,000 to about 45,000 and an average molecular weight distribution, $\overline{M}_w/\overline{M}_n$, of about 2 to about 6; and

Component (B) from about 15 to about 5 parts of a cyclic hydrocarbon of from 9 to about 25 carbon atoms which may contain up to two hetero-oxygen atoms, comprising 1 to 3 benzoaromatic rings;

thereby introducing chloromethyl or bromomethyl groups on about 70 to 90 percent of the aromatic rings of said first composition and obtaining as a result thereof a chloromethylated or bromomethylated second composition and thereafter reacting the second composition with a tertiary amine of the formula



wherein $-R_1$, $-R_2$ and $-R_3$ are independently $-CH_2CH_2OH$, $-CH_2CHOHCH_3$, $-CH_2CHOHCH_2OH$, alkyl, aryl, cycloalkyl or aralkyl, in an amount sufficient to convert at least about 90 percent of the chloromethyl or bromomethyl groups of the second composition to quaternary ammonium groups.

4,130,689

PRODUCTION OF HIGH STRENGTH HOLLOW RAYON FIBERS

Eugene Costa, Jr., Goshen, N.Y., assignor to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 694,918, Jun. 11, 1976, abandoned. This application May 20, 1977, Ser. No. 798,874
Int. Cl.[2] D01F *2/08*
U.S. Cl. 428—398 **25 Claims**

1. A process for producing hollow rayon fibers resistant to collapse after drying, which process comprises spinning a viscose solution containing alkali cellulose, a blowing agent selected from the class consisting of alkali-metal carbonates and bicarbonates, carbon disulfide, and ripened to a Salt Index of from about 6 to 12 cubic centimeters of sodium chloride, into an aqueous acidic coagulating bath containing from about 150 to 220 grams per liter of sodium sulfate, from about 120 to 160 grams per liter of sulfuric acid, and from about 30 to 80 grams per liter of zinc sulfate, and thereafter stretching the resulting hollow rayon fibers by between about 40 and 120%.

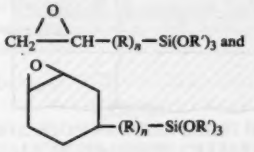
4,130,690

ABRASION RESISTANT COATINGS CURED IN THE PRESENCE OF PF_5, SbF_5, OR $HSbF_6$

Larry A. Lien, White Bear Lake, and J. Lamar Zollinger, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sep. 12, 1977, Ser. No. 832,400
Int. Cl.[2] B32B *27/36, 27/06, 9/04*
U.S. Cl. 428—412 **4 Claims**

1. An abrasion resistant coating on a substrate, said coating having at most 30% haze according to ASTM D 968-51 using 1 liter of sand in 10–11 seconds and comprising a polymer having at least 15% by weight units derived from an epoxy-terminated silane of the formulae:



cured in the presence of a catalytically active amount of PF_5, SbF_5 or $HSbF_6$.

4,130,691

CHEMICAL COMPOSITION

Pierre Canard, Versailles, and Albert Levy, Orly, both of France, assignors to Rhone Poulenc Industries, Paris, France

Filed Mar. 12, 1976, Ser. No. 666,489
Int. Cl.[2] D21H *1/28*
U.S. Cl. 428—511 **6 Claims**

1. A coated offset printing paper comprising a paper base sheet and a coating on the paper base sheet, consisting essentially of a pigment and binder in which the principal film-forming constituent consists of an aqueous latex of a copomer of butadiene, styrene and unsaturated carboxylic acid, consisting essentially of 35 to 40% by weight of butadiene, 50 to 63% by weight of styrene, and 2 to 10% by weight of at least one unsaturated carboxylic ethylenic acid, the particles of which have a diameter in the range 0.20 to 0.30 micron in which the film forming constituent is present in the ratio of 14–15 parts by weight per 100 parts by weight of pigment.

4,130,692
COATING COMPOSITIONS COMPRISING ALKOXYMETHYLAMINOTRIAZINES, POLYOLS AND POLYETHER TRIOLS

George J. Anderson, East Longmeadow; Timothy F. Desmond, Longmeadow, and J. Owen Santer, East Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

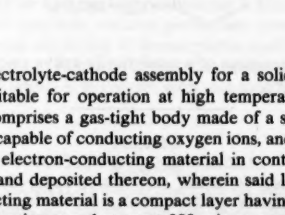
Filed Oct. 20, 1976, Ser. No. 734,080
Int. Cl.[2] C08L *61/28*
U.S. Cl. 428—524 19 Claims

1. A liquid composition consisting essentially of a polyol, a polyoxypropylene triol of molecular weight in the range of about 500 to about 1000 and a substantially completely methylolated polyaminotriazine substantially fully etherified with at least one C_1 to C_4 alcohol, wherein the polyol is selected from the group consisting of 1,5-pentanediol, 1,4-dimethylolcyclohexane, and 2,2-dimethyl-3-hydroxypropyl 2,2-dimethyl-3-hydropropionate, wherein the weight ratio of polyol to polyoxypropylene triol is in the range of about 90:10 to about 55:45, and wherein the ratio of hydroxyl groups of the polyol and the polyoxypropylene triol to alkoxymethyl groups of the polyaminotriazine is in the range of about 1:1 to about 1:2.

4,130,693
ELECTROLYTE-CATHODE ASSEMBLY FOR A FUEL CELL

Paul Van Den Berghe, 43, Cours Sablon, 63000 Clermont Ferrand, France, and Helmut Tannenberger, La Villette 218, 1451 Le Chateau de Ste Croix, Switzerland

Filed May 27, 1977, Ser. No. 801,392
Claims priority, application Switzerland, May 28, 1976, 6737/76
Int. Cl.[2] H01M *4/86*
U.S. Cl. 429—41 6 Claims

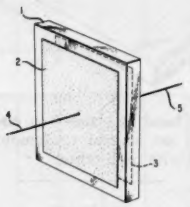


1. An electrolyte-cathode assembly for a solid electrolyte fuel cell suitable for operation at high temperatures, which assembly comprises a gas-tight body made of a solid ceramic electrolyte capable of conducting oxygen ions, and at least one layer of an electron-conducting material in contact with the electrolyte and deposited thereon, wherein said layer of electron-conducting material is a compact layer having a thickness of at least 1 micron and at most 200 microns and made of a mixture containing from 20 to 80% by volume of indium oxide In_2O_3 doped with tin oxide, the remainder being a ceramic material capable of conducting oxygen ions at the cell operating temperature and which is a mixed oxide solid solution, crystallized in the cubic system, consisting essentially of zirconium oxide ZrO_2 and at least one oxide stabilizing the cubic phase of zirconium oxide, said layer being covered by a compact surface layer having a thickness of at least 1 micron and at most 10 microns of ceramic material capable of conducting electrons and oxygen ions and which is a mixed oxide solid solution crystallized in the cubic system, consisting essentially of (1) zirconium oxide ZrO_2, (2) at least one oxide stabilizing the cubic phase of zirconium oxide and (3) uranium oxide UO_2.

4,130,694
AMORPHOUS METAL OXIDE MATERIAL BETWEEN ELECTRODES OF A CELL

Alastair M. Glass; Malcolm E. Lines, both of Millington, and Kurt Nassau, Bernardsville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 15, 1977, Ser. No. 824,419
Int. Cl.[2] H01M *6/18;* H01G *9/02*
U.S. Cl. 429—193 13 Claims

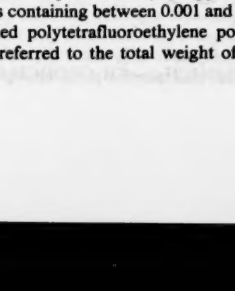


1. Device comprising a portion of material together with spaced electrodes intimately contacting the portion, the said material being amorphous within a region defining a continuous path intermediate the said electrodes, the amorphous state being characterized by absence of long-range ordering over a distance of at least 100 Angstrom units as indicated by X-ray diffraction, CHARACTERIZED IN THAT the said material comprises a composition which may be represented by the stoichiometry $X_{0.5\text{-}1.2}Z_{1.1\text{-}0.96}O_3$ in which X is at least one element selected from the group consisting of Li, Na, K; Z is at least one element selected from the group consisting of Nb, Ta; and O is oxygen.

4,130,695
LEAD-ACID STORAGE BATTERY AND ELECTRODE THEREFOR

Hermann Dietz, Gerlingen, and Siegfried Ziegler, Hildesheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 21, 1977, Ser. No. 853,431
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658493
Int. Cl.[2] H01M *4/14, 10/06*
U.S. Cl. 429—215 9 Claims



1. An electrode for a lead-acid storage battery comprising a metal support consisting at least partly of lead and an electrochemically active composite mass (16) supported thereon, said composite mass containing between 0.001 and 0.1% by weight of finely divided polytetrafluoroethylene powder, said percentage being referred to the total weight of said composite mass.

4,130,696
CONDUCTIVE DILUENT FOR PRESSED NICKEL ELECTRODES

Ronald G. Gunther, Mystic, Conn., assignor to Yardney Electric Corporation, Pawcatuck, Conn.

Filed Sep. 9, 1976, Ser. No. 721,910
Int. Cl.[2] H01M 4/32
U.S. Cl. 429—223 13 Claims

1. In a pressed nickel electrode comprising an apertured current collector, and an electrode admixture pressed therein, said electrode admixture comprising an active nickel-containing electrode material, a conductive diluent and a binder, the improvement which comprises:

having as said an conductive diluent admixture homogeneously mixed with said active electrode material and said binder, and consisting essentially of nickel flake and powdered carbon in amounts between about 4% and about 10% by weight and between about 5% and about 10% by weight, respectively, of the total weight of said active electrode material, said conductive diluent admixture, and said binder, said conductive diluent admixture being between about 10% and about 15% by weight of said total weight.

4,130,697
PROCESS FOR THE PRODUCTION OF FOAMED PLASTICS WITH IMPROVED COMBUSTION CHARACTERISTICS

Gerhard Stern, and Karlheinz Wegleitner, both of Linz, Austria, assignors to Chemie Linz Aktiengesellschaft, Austria

Filed Jul. 26, 1977, Ser. No. 819,504
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634417
Int. Cl.[2] C08G 18/54, 18/15
U.S. Cl. 521—106 9 Claims

1. In a process for production foamed plastics with improved combustion characteristics by a condensation reaction of aminoplast resins with isocyanates which are at least bifunctional, the improvement comprising using as starting material an aqueous solution of a precondensate of formaldehyde with an aminoplast forming compound selected from the group consisting of urea and melamine, which solution contains from 0.5 to 20 parts by weight of the precondensate per part by weight of water, adding to the isocyanate or its mixture with the aqueous solution of the precondensate but separately from the solution of the precondensate an acid catalyst in an amount of 1 part by weight per at least 20 parts by weight of the precondensate and condensing the precondensate with the isocyanate at temperatures of between 20° to 100° C., whereby the weight ratio of precondensate to isocyanate used is from 0.20 to 15:1.

6. A process according to claim 1, in which the acid catalyst used is phosphoric acid.

7. A process according to claim 1, in which the acid catalyst used is phosphorus trichloride.

4,130,698
POLYURETHANE FOAM CONTAINING INTERNAL MOLD-RELEASE AGENT

David J. Sparrow, Korbeek-lo, and Willy Van Autgaerden, Heverlee, both of Belgium, assignors to Imperial Chemical Industries Limited, London, England

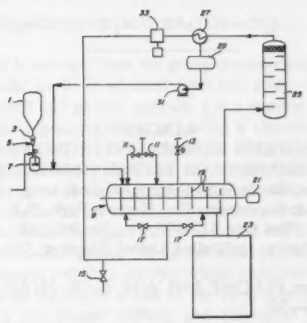
Filed Mar. 1, 1977, Ser. No. 773,230
Claims priority, application United Kingdom, Mar. 29, 1976, 12536/76
Int. Cl.[2] C08G 18/14, 18/08; C09K 3/00
U.S. Cl. 521—130 12 Claims

1. A process for the production of polyurethane foam mouldings which comprises foaming a reaction mixture which comprises (A) an aromatic polyisocyanate containing at least two isocyanate groups, (B) at least one compound containing at least two isocyanate reactive groups, (C) a foaming agent, (D) a foam stabiliser and (E) 2% to 8% by weight based on the weight of (B) of at least one processing aid which is an ester of fatty acid containing 6 to 25 carbon atoms and an aliphatic saturated alcohol containing 2 to 4 hydroxyl groups, said reaction being carried out in a closed mould.

4,130,699
VAPOR PHASE POLYMERIZATION WITH TEMPORARILY INACTIVE TITANIUM CATALYST

Glen R. Hoff; John L. Melquist, both of Naperville, Ill., and Peter Fotis, Highland, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 25, 1977, Ser. No. 854,831
Int. Cl.[2] C08F 2/34, 10/00
U.S. Cl. 526—67 22 Claims



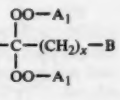
1. The method of producing a resinous polymer of olefin by vapor phase polymerization of an olefin which comprises conveying inactive high yield titanium catalyst component to a vapor phase polymerization reactor with a liquid comprising recycled quench liquid, reactivating said inactive high yield titanium catalyst component inside the reactor with a metal alkyl reducing agent and polymerizing olefin under gas phase polymerization conditions with reactivated high yield catalyst to form a resinous polymer of an olefin having a low level of catalyst residues.

4,130,700
POLYMERIZATION PROCESS USING DIPEROXY KETALS AS FINISHING CATALYSTS

Vasanth R. Kamath, Tonawanda, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 6, 1977, Ser. No. 757,189
Int. Cl.[2] C08F 2/00, 4/38, 12/02, 112/02
U.S. Cl. 526—73 9 Claims

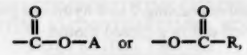
1. A process for the free-radical polymerization of vinyl monomers, including vinyl aromatic monomers, comprising polymerizing said vinyl monomers, at least two distinct progressively high polymerization temperatures, each between the temperatures of about 70° C. to about 150° C. in the presence of at least two free-radical initiators, one of which initiators, used in relatively minor proportions as a finishing catalyst, has the formula



wherein

x is a numeral from 1 to 5 inclusive,

B is



A is hydrocarbyl

A_1 is tertiary hydrocarbyl, and

R is A, hydrocarbyloxy or alkylperoxy,

and the other initiator, used in relatively major proportions, has a 10 hour half-life temperature below about 100° C., wherein the same solvent is used for measuring the half-life of all initiators and wherein the time to produce polymer without more than 0.1 weight percent residual monomer is reduced by at least 20% of the time required than when the diperoxyketal finishing initiator is not present.

4,130,701
PETROLEUM RESINS CONTAINING VINYL NORBORNENE OR TETRAHYDROINDENE

André Lepert, Rhode Saint Genese, Belgium, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 12, 1977, Ser. No. 841,345

Claims priority, application United Kingdom, Oct. 19, 1976, 43305/76

Int. Cl.[2] C08F *2/00, 4/14, 32/08, 232/08*

U.S. Cl. 526—76 9 Claims

1. A process for preparing a resin suitable as a tackifier which comprises polymerizing using a Friedel Crafts catalyst:

(1) a petroleum resin feed comprising C_5 olefins and diolefins, C_6 olefins and diolefins or a mixture of C_5 and C_6 olefins and diolefins, said feed being obtained from the cracking of petroleum feedstock, and

(2) an additive comprising a non-aromatic cyclic compound, said compound being vinyl norbornene or tetrahydroindene.

4,130,702
POLYACRYLOYLAMINOBENZOIC ACID, POLYMETHACRYLOYLAMINOBENZOIC ACID AND METHOD OF PREPARATION

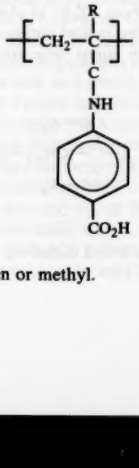
Eui W. Choe, Randolph, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,280

Int. Cl.[2] C08F *4/30, 2/10, 20/64, 20/58*

U.S. Cl. 526—93 12 Claims

1. A polymer capable of forming an anisotropic melt consisting essentially of recurring units of the formula:



wherein R is hydrogen or methyl.

4,130,703
HETEROGENEOUS ANIONIC POLYMERIZATION PROCESS

Ilia Rashkov, Sofia, Bulgaria; Jean Golé, Thurins, France; Daniel Guérard, Malzeville, France; Albert Hérold, Laxou, France; Gérard Merle, Oullins, France; Ivan M. Panayotov, Sofia, Bulgaria; Jean-Pierre Pascault, Villeurbanne, France; Quang T. Pham; Christian Pillot, both of Caluire, France, and Robert Salle, Lyon, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Division of Ser. No. 793,551, May 4, 1977, which is a division of Ser. No. 695,837, Jun. 14, 1976, Pat. No. 4,035,562. This application Mar. 2, 1978, Ser. No. 882,932

Claims priority, application Bulgaria, Jul. 14, 1975, 30292

Int. Cl.[2] C08F *4/02, 4/08, 36/06, 36/08*

U.S. Cl. 526—173 4 Claims

1. In a heterogeneous anionic polymerization process wherein at least one monomer having a conjugated diene structure is being polymerized, wherein at least one catalyst comprising a carbon with a graphitic structure and at least one element, such as lithium, is inserted in said carbon catalyst, and wherein an aromatic hydrocarbon is also inserted in said graphitic structure, the improvement in the process comprising dissolving said monomer and suspending said catalyst in an aromatic solvent.

4,130,704
PROCESS FOR PRODUCING SULFUR MODIFIED POLYCHLOROPRENE IN THE PRESENCE OF QUATERNARY AMMONIUM SALTS

Akihiko Shimizu, and Atsushi Kita, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

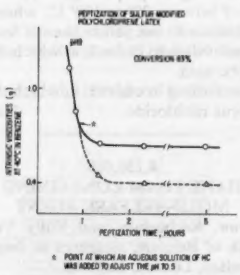
Continuation of Ser. No. 601,997, Aug. 5, 1975, Pat. No. 4,076,927. This application Apr. 4, 1977, Ser. No. 784,512

Claims priority, application Japan, Aug. 6, 1974, 49-89497

The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.

Int. Cl.[2] C08F *2/28, 136/18*

U.S. Cl. 526—217 7 Claims



1. A process for producing sulfur modified polychloroprene polymers, which comprises:

polymerizing chloroprene or a mixture of chloroprene and a comonomer with sulfur and a peroxide initiator in a neutral or acidic aqueous emulsion in the presence of a nitrogen containing cationic emulsifier; and then

peptizing the resulting sulfur modified polychloroprene latex by adding a peptizing agent consisting of an alkaline aqueous solution to said latex in a quantity to adjust the pH of the latex to a value greater than 8.

4,130,705

POLYMERS OF PIVALOYLOXYALKYL METHACRYLATES, METHOD FOR THEIR PREPARATION AND MODIFICATION

Stanislav Sevcik; Jiri Trekoval; Jan Holata, and Jiri Stamberg, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

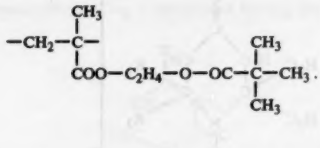
Continuation-in-part of Ser. No. 590,635, Jun. 26, 1975, abandoned. This application Mar. 31, 1977, Ser. No. 783,398

Claims priority, application Czechoslovakia, Jun. 27, 1974, 4540-74; Jun. 27, 1974, 4541-74; Jun. 27, 1974, 4542-74

Int. Cl.[2] C08F *22/10, 4/32, 4/34*

U.S. Cl. 526—230 5 Claims

1. Pivaloyloxyethyl methacrylate polymers containing structural units having the general formula:



4,130,706

HYDROPHILIC, OXYGEN PERMEABLE CONTACT LENS

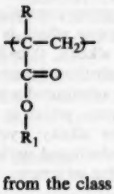
Louis Plambeck, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 8, 1977, Ser. No. 822,719

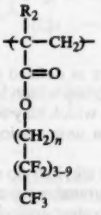
Int. Cl.[2] C08F *214/18;* G02C *7/04*

U.S. Cl. 526—245 8 Claims

1. A contact lens having a surface formed of a polymer consisting essentially of from 20 to 80 weight percent units of the structure



wherein —R is selected from the class consisting of —H and $-CH_3$ and $-R_1$ is a group containing from 2 to 10 carbon atoms which contains at least one polar group selected from the class consisting of —OH, —COOH, $CONH_2$, and $-SO_3H$, and from 80 to 20 weight percent units of the structure



wherein $-R_2$ is selected from the class consisting of —H and $-CH_3$ and n is an integer from 1 to 4, which polymer on being saturated with water has an oxygen permeability of at least 500 centibarrers and a receding contact angle with water of less than 35°.

4,130,707

ADHESIVE COMPOSITIONS

Manfred Leiser; Karl-Heinrich Wegehaupt, and Wilhelm Marsch, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Division of Ser. No. 546,246, Feb. 3, 1975, Pat. No. 4,051,454, which is a continuation of Ser. No. 443,533, Feb. 19, 1974, abandoned. This application May 4, 1977, Ser. No. 793,576

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1973, 2307776

Int. Cl.[2] C08G *77/04*

U.S. Cl. 528—15 5 Claims

1. A method for bonding plastic films prepared from organic polymers which comprises coating each surface of the plastic film with a composition consisting essentially of (a) a vinyl containing organopolysiloxane having the formula

$$R_2(CH_2{=}CH)SiO(R'_2SiO)_n\,SiR_2\,(CH{=}CH_2)$$

wherein R is selected from the group consisting of methyl and phenyl radicals, R′ is selected from the group consisting of methyl, vinyl and phenyl radicals, n is a number sufficient to provide an organopolysiloxane having a viscosity of at least 100,000 cP at 25° C. in which 0.1 to 1 mol percent of the diorganopolysiloxane units are vinylmethylsiloxanes and at least 90 percent of the remaining organic radicals consist of methyl radicals, (b) an organopolysiloxane containing at least three Si-bonded hydrogen atoms in which the Si-bonded hydrogen atoms are present in an amount of from 0.01 to 1.7 weight percent and (c) a catalyst which promotes the addition of Si-bonded hydrogen atoms to the vinyl groups, intimately contacting the coated surfaces and thereafter heating to a temperature of from 100° to 200° C.

4,130,708

SILOXANE URETHANE ACRYLATE RADIATION CURABLE COMPOUNDS FOR USE IN COATING COMPOSITIONS

Charles B. Friedlander, Glenshaw, and John C. McMullen, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 9, 1977, Ser. No. 858,974

Int. Cl.[2] C08G *77/04*

U.S. Cl. 528—28 14 Claims

1. Radiation polymerizable compound comprising the reaction product of:

(A) at least one siloxy-containing polycarbinol compound;

(B) a polyisocyanate; and

(C) a polyfunctional compound having at least one functional group which is reactive with an isocyanato group of said polyisocyanate and which polyfunctional compound after reaction with said isocyanato group provides at least one ethylenic functional group in said reaction product.

4,130,709

PLEUROMUTILIN GLYCOSIDE DERIVATIVES

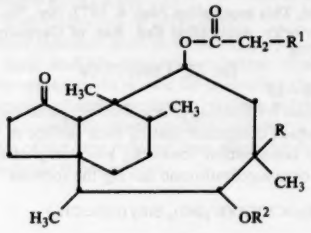
Ramakrishnan Nagarajan, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 8, 1977, Ser. No. 858,507

Int. Cl.[2] C07G *11/00*

U.S. Cl. 536—17 39 Claims

1. A compound of the formulaa:



wherein R is ethyl or vinyl; R^1 is selected from the group consisting of:

(a) the α- and β-anomers of the following hexopyranoses and hexofuranoses: D- and L-glucose; D- and L-galactose; D- and L-mannose; D- and L-gulose; D- and L-idose; D- and L-altrose; L- and D-rhamnose; D- and L-fucose; 1-thio-D- and L-glucose; 1-thio-D- and L-galactose; 1-thio-D- and L-mannose; 1-thio-D- and L-gulose; 1-thio-D- and L-idose; 1-thio-D- and L-altrose; 1-thio-L- and D-rhamnose; and 1-thio-D- and L-fucose;

(b) the α- and β-anomers of the following pentopyranoses and pentofuranoses: D- and L-lyxose, D- and L-ribose, L- and D-arabinose, D- and L-2-deoxyribose; 1-thio-D- and L-lyxose, 1-thio-D- and L-ribose, 1-thio-L- and D-arabinose; and D- and L-2-deoxy-1-thioribose;

(c) the α- and β-anomers of the following pentofuranoses: D- and L-xylose and 1-thio-D- and L-xylose;

(d) the α- and β-anomers of the pentopyranose forms of L-xylose and 1-thio-D- and L-xylose;

(e) the α-anomer of the pentopyranoses form of D-xylose;

(f) the α- and β-anomers of the following pyranose and furanose aminosugars: 2-deoxy-2-amino-D- and L-glucose; 2-deoxy-2-amino-D- and L-mannose; 2-deoxy-2-amino-D- and L-xylose; 2-deoxy-2-amino-D- and L-lyxose, 2-deoxy-2-amino-D- and L-galactose; 4-deoxy-4-amino-D- and L-xylose; 2-deoxy-2-amino-1-thio-D- and L-glucose; 2-deoxy-2-amino-1-thio-D- and L-mannose; 2-deoxy-2-amino-1-thio-D- and L-xylose; 2-deoxy-2-amino-1-thio-D- and L-lyxose; 1-thio-D- and L-galactosamine; 4-deoxy-4-amino-1-thio-D- and L-xylose; and the N-mono(C_1–C_4)alkyl and N,N-di(C_1–C_4)alkyl derivatives of these aminosugars;

(g) the α- and β-anomers of the following disaccharides: maltose, cellobiose; lactose; gentiobiose; isomaltose; melibiose; raffinose; and xylobiose; 1-thiomaltose; 1-thiocellobiose; 1-thiolactose; 1-thiogentiobiose; 1-thioisomaltose; 1-thiomelibiose, 1-thioraffinose; and 1-thioxylobiose;

(h) the α- and β-anomers of the trisaccharides maltotriose; cellotriose; xylotriose; 1-thiomaltotriose; 1-thiocellotriose and 1-thioxylotriose;

(i) 2-deoxy-2-(hydroxyimino)-3,4,6-tri-O-acetyl-α-D-glucopyranoxyl; 2-deoxy-2-(hydroxyimino)-3,4,6-tri-O-acetyl-α-D-galactopyranosyl; 2-deoxy-2-(hydroxyimino)-α-D-galactopyranosyl; 2-deoxy-2-amino-4,6-di-O-acetyl-α-D-glucopyranosyl; 2-deoxy-2-acetamido-3,4,6-tri-O-acetyl-α-D-glucopyranosyl;

(j) and any of the (a) through (h) moieties peracylated with C_2–C_4-alkanoyl or benzoyl;

R^2 is hydrogen or, when R^1 is selected from the group defined in (j), C_2–C_6-alkanoyl or benzoyl; and the pharmaceutically acceptable acid-addition salts of the compounds wherein R^1 is selected from the group defined in (f).

4,130,710

PIPERIDINE DERIVATIVES

Barry Cook, Flixton, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

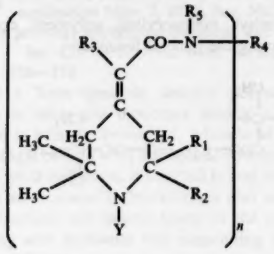
Division of Ser. No. 380,041, Jul. 17, 1973, Pat. No. 3,971,795. This application Apr. 23, 1976, Ser. No. 679,530

Claims priority, application United Kingdom, Jul. 28, 1972, 35486/72

Int. Cl.² C07D *211/32*

U.S. Cl. 542—418 **19 Claims**

1. A compound of the formula I



I

wherein

n is 1, 2, 3 or 4,

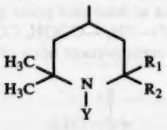
Y is hydrogen or a straight- or branched alkyl group having from 1 to 12 carbon atoms, an alkenyl group having from 3 to 12 carbon atoms or an aralkyl group having from 7 to 12 carbon atoms

R_1 and R_2 are the same or different and each is a straight-or branched alkyl group having from 1 to 12 carbon atoms or R_1 and R_2, together with the carbon atom to which they are attached, form a cycloalkyl group having from 5 to 12 carbon atoms,

R_3 is hydrogen, a straight- or branched alkyl group having from 1 to 4 carbon atoms, an aralkyl group having from 7 to 12 carbon atoms, or a cycloalkyl group having from 5 to 6 carbon atoms

R_4 is a group having from 1 to 20 carbon atoms which is selected from the group consisting of

when *n* is 1, alkyl group which is unsubstituted or substituted, with alkyl, alkoxy, thioalkyl, halogen, phenyl or alkyl or chlorine substituted benzyl; alkenyl group which is unsubstituted or substituted with alkyl or phenyl; alkynyl group; aryl group which is unsubstituted or substituted with alkyl or alkoxy; cycloalkyl group which is unsubstituted or substituted with alkyl, alkoxy, or halogen; hydrogen or the structure:



wherein Y, R_1 and R_2 are as defined above,

when *n* is 2, alkylene group which is unsubstituted or substituted with alkyl and which may be oxygen or sulfur interrupted or possess an unsaturation; cycloalkylene group; arylene;

when *n* is 3, a trivalent alkyl group of 3 to 15 carbons which is saturated or unsaturated; a trivalent cycloalkyl group of 5 to 15 carbons; a trivalent aralkyl group of 9 to 15 carbon atoms or a trivalent aryl group of 6 to 15 carbons;

when *n* is 4, a tetravalent alkyl group of 4 to 12 carbons which is saturated or unsaturated or a tetravalent cycloalkyl group of 5 to 12 carbons; and R_5 has the same significance as R_3 or when *n* is 1, R_5 and R_4, together with the nitrogen atom to which they are bound form a heterocy-

clic group having from 4 to 10 carbon atoms and nitrogen as the only hetero atom, or R_5 and R_4, together with the nitrogen atom to which they are bound, form 1- morpholinyl group and a salt of the amine function of a compound of formula I.

4,130,711

PROCESS FOR PRODUCTION OF PIPERAZINEDIONES

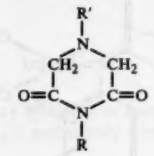
George D. Shier, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 718,292, Aug. 27, 1976, Pat. No. 4,082,748. This application Dec. 5, 1977, Ser. No. 857,062

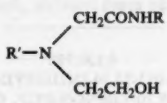
Int. Cl.² C07D *241/08*

U.S. Cl. 544—385 **4 Claims**

1. A process for making a compound having the formula



wherein R and R′ are each independently a hydrocarbon group of 1–8 carbon atoms, which process comprises dehydrogenating by contacting a compound of the formula



with a reduced copper dehydrogenation catalyst in the presence of hydrogen at a temperature of about 200°–300° C.

4,130,712

SYNTHESIS OF BIOTIN

Janis Vasilevskis, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

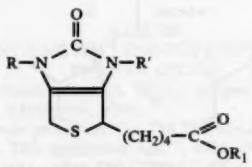
Continuation-in-part of Ser. No. 704,157, Jul. 12, 1976, abandoned. This application Jun. 17, 1977, Ser. No. 807,760

Int. Cl.² C07D *495/04*

U.S. Cl. 548—303 **7 Claims**

1. A compound of the formula

III



wherein R and R′ are lower alkanoyl; and R_1 is hydrogen, lower alkyl or lower alkanoyl.

4,130,713

BIOTIN INTERMEDIATES

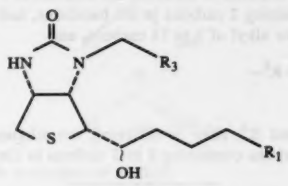
Enrico G. Baggiolini, Nutley; Hsi L. Lee, West Paterson, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 5, 1977, Ser. No. 822,119

Int. Cl.² C07D *495/04*

U.S. Cl. 548—303 **2 Claims**

1. Compounds of the formula:



the enantiomers and racemates thereof,

wherein R_1 is lower alkyl or $—CH_2OR_4$, where R_4 is lower alkyl or benzyl; and R_3 is phenyl, naphthyl, anthryl, phenanthryl or azulyl which may be unsubstituted or substituted in one or more positions with lower alkylenedioxy, halogen, nitro, lower alkyl or lower alkoxy.

4,130,714

HYDANTOIN THERAPEUTIC AGENTS

Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

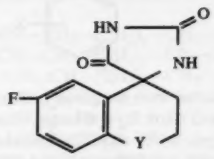
Filed May 23, 1977, Ser. No. 799,586

The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.

Int. Cl.² C07D *491/10, 495/10*

U.S. Cl. 548—309 **5 Claims**

1. A compound selected from the group consisting of the dextrorotatory isomers of asymmetric spiro-hydantoins of the formula:



and the base salts thereof with pharmacologically acceptable cations, wherein Y is oxygen or sulfur.

4,130,715

TRICYCLIC TRISAMINOMETHANES

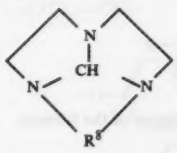
Thomas J. Atkins, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 647,643, Jan. 7, 1976, Pat. No. 4,085,106. This application Jan. 26, 1978, Ser. No. 872,663

Int. Cl.² C07D *497/18, 478/18*

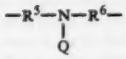
U.S. Cl. 548—324 **9 Claims**

1. A tricyclic trisaminomethane of the formula



in which

R^8 is a divalent group selected from the group consisting of alkylene of 2 to 6 carbons containing 2 carbons in the backbone,



where

R^5 and R^6, alike or different, are alkylene of 2 to 6 carbons containing 2 carbons in the backbone, and Q is hydrogen or alkyl of 1 to 18 carbons, and

$$-R^5\text{-}O\text{-}R^6-$$

where

R^5 and R^6, alike or different, are alkylene of 2 to 6 carbons containing 2 to 3 carbons in the backbone.

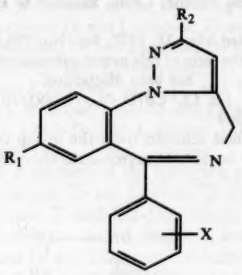
4,130,716

PYRAZOLO BENZODIAZEPINES

Norman Gilman, Wayne, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

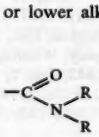
Filed Mar. 7, 1977, Ser. No. 775,346
Int. Cl.² C07D *487/04*
U.S. Cl. 548—369 **6 Claims**

1. A compound of the formula

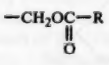


wherein R_1 is selected from the group consisting of hydrogen, amino, halogen and nitro; R_2 is selected from the group consisting of hydrogen, lower alkyl, carboxaldehyde, cycloalkyl up to 7 cabon atoms, a substituent of the formula

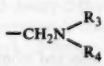
wherein R is hydrogen or lower alkyl, a substituent of the formula



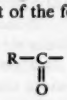
wherein R is hydrogen or lower alkyl, C_1 to C_7 alkylhydroxy, a substituent of the formula



wherein R is lower alkyl, a substituent of the formula



wherein R_3 and R_4 are hydrogen or lower alkyl or R_3 is hydrogen and R_4 is a substituent of the formula



wherein R is hydrogen or C_1 to C_6; and X is hydrogen or halogen and the pharmaceutically acceptable salts thereof.

4,130,717

PROCESS AND INTERMEDIATES FOR ISOINDOLE DERIVATIVES

Roland Jaunin, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 813,590, Jul. 7, 1977, Pat. No. 4,089,875. This application Feb. 17, 1978, Ser. No. 878,627
Claims priority, application Austria, Aug. 2, 1976, 5704/76
Int. Cl.² C07C *101/20, 119/14*
U.S. Cl. 560—35 **7 Claims**

1. A malonic acid ester of the formula

II

wherein R is alkyl, R_1, R_2, R_3 and R_4, independently, are hydrogen, halogen, alkyl, alkoxy or trifluoromethyl, and R_5 is hydrogen, alkanoyl or aroyl.

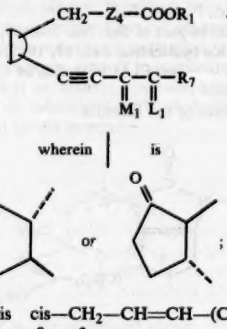
4,130,718

CIS-4,5-DIDEHYDRO-13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-18,19,20-TRINON-PGE, COMPOUNDS

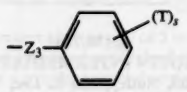
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,980
Int. Cl.² C07C *177/00*
U.S. Cl. 560—53 **73 Claims**

1. A prostaglandin analog of the formula

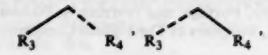


wherein Z$_4$ is cis—CH$_2$—CH=CH—(CH$_2$)$_g$—CH$_2$—, wherein g is one, 2, or 3;
wherein R_7 is

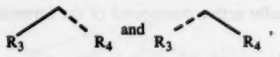


wherein Z_3 is oxa or methylene, s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein L_1 is

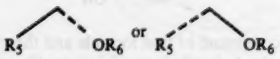


or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene;

wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,130,719

METHOD OF MAKING HIGH PURITY MONOMERS FROM DICARBOXYLIC ACID MONOESTERS AND RESULTANT POLYMERS

Steven A. Cerefice, Naperville; Ellis K. Fields, River Forest; Kerford A. Marchant, Jr., Evanston, and Edward E. Paschke, Glen Ellyn, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 1, 1976, Ser. No. 701,902
Int. Cl.[2] C07C *69/78*
U.S. Cl. 528—305 **7 Claims**

1. As a composition of matter, poly (m-methylenebenzoate) characterized by an inherent viscosity of at least about 0.44 dl./g.

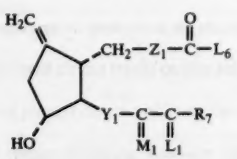
4,130,720

9-DEOXY-9-METHYLENE-PGF-p-SUBSTITUTED PHENYL ESTERS

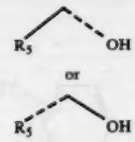
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805. This application Apr. 7, 1978, Ser. No. 894,272
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—61 **17 Claims**

1. A prostaglandin analog of the formula

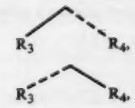


wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2CH_2— wherein M_1 is

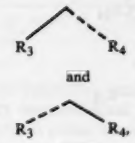


wherein R_5 is hydrogen or methyl;

wherein L_1 is



or a mixture of

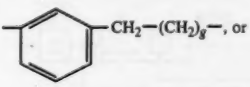


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

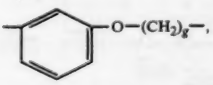
wherein Z_1 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,

(9)



(10)

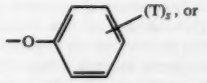


wherein g is one, 2 or 3;

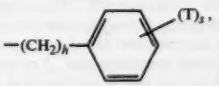
wherein R_7 is

(1) —$(CH_2)_m$—CH_3,

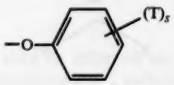
(2)



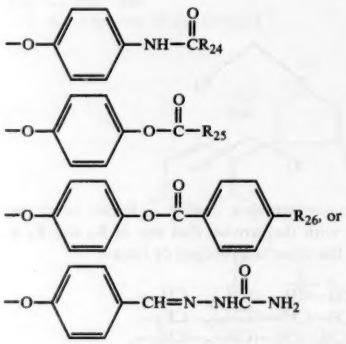
(3)



wherein m is one to 5, inclusive, h is zero or one, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different; and wherein L_6 is p-substituted phenoxy selected from the group consisting of



wherein R_{24} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{25} is methyl, phenyl, $-NH_2$, or methoxy; and R_{26} is hydrogen or acetamido.

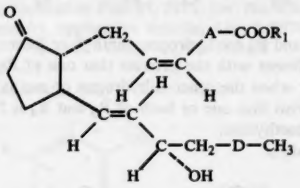
4,130,721

11-DEOXY PGE_2 COMPOUNDS

Gordon L. Bundy, Portage, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 24, 1972, Ser. No. 274,650
Int. Cl.[2] C07C 177/00
U.S. Cl. 560—121 3 Claims

1. An optically active compound of the formula



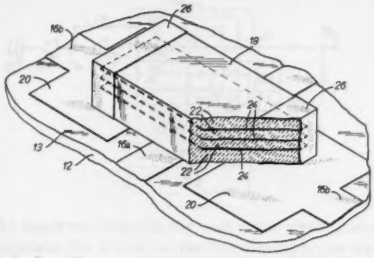
or a racemic compound of that formula and the mirror image thereof, wherein A is alkylene of one to 10 carbon atoms, inclusive, with one to five carbon atoms, inclusive, between $-COOR_1$ and

wherein D is either a valence bond or alkylene of one to nine carbon atoms, inclusive, with one to five carbon atoms, inclusive, in the chain between $-CH_2-$ and terminal methyl; inclusive; and wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of three to 10 carbon atoms, inclusive, aralkyl of seven to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, two, or three chloro or alkyl of one to four carbon atoms, inclusive; including the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,130,722
THICK-FILM CIRCUIT MODULE INCLUDING A MONOLITHIC CERAMIC CROSS-OVER DEVICE

David H. Levijoki, Milwaukee, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Jan. 10, 1977, Ser. No. 758,075
Int. Cl.[2] H05K 1/00
U.S. Cl. 174—68.5 9 Claims



1. A non-signal altering ceramic cross-over device for use in a film-type circuit comprising:

a plurality of generally planar layers of ceramic dielectric material disposed in laminated stacked relationship, said layers having opposite ends and opposite edges;

at least one generally thin planar non-signal altering electrically conductive path interposed between two of said layers of ceramic material, said conductive path having opposite ends and opposite edges, said opposite edges of the electrically conductive path being spatially positioned inwardly of the opposite edges of said layers of ceramic material, the layers of ceramic dielectric material and interposed conductive path forming a laterally surfaced dielectric monolithic structure;

a first termination end cap of electrically conductive material supported on said monolithic structure and coating at least a portion of one of said opposite ends of each of said layers of ceramic material, and said first termination end cap being in electrically conductive communication with one of said opposite ends of said conductive path; and

a second termination end cap of electrically conductive material supported on said monolithic structure and coating at least a portion of the other of said opposite ends of each of said layers of ceramic material and being in electrically conductive communication with the other of said opposite ends of said electrically conductive path.

4,130,723
PRINTED CIRCUIT WITH LATERALLY DISPLACED GROUND AND SIGNAL CONDUCTOR TRACKS

Antony J. Wakeling, Fleet, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Oct. 18, 1977, Ser. No. 843,195
Claims priority, application United Kingdom, Nov. 19, 1976, 48301/76
Int. Cl.[2] H05K 1/02
U.S. Cl. 174—68.5 5 Claims

1. A printed circuit for use as a multi-line signal transmission circuit comprising:

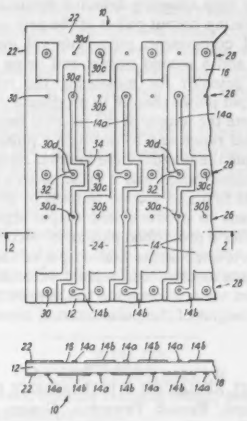
a double-sided support made from an electrically insulating material;

a first set of printed circuit tracks on one side of the support; and

a second set of printed circuit tracks on the other side of the support;

each set of tracks including alternate signal tracks and ground tracks disposed side by side;

the signal tracks and ground tracks on said one side of the support being disposed substantially opposite the ground tracks and signal tracks respectively on the other side of the support;

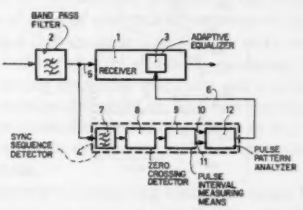


substantially all the respective ground tracks of each set being electrically interconnected at a plurality of points along their length via plated through holes to the ground tracks of the other set.

4,130,724
DATA RECEIVER WITH SYNCHRONIZING SEQUENCE DETECTION CIRCUIT

Michel A. M. J. Bousmar, and Michel J. P. Christiaens, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1977, Ser. No. 795,877
Claims priority, application Netherlands, May 18, 1976, 7605275
Int. Cl.[2] H04L 7/00
U.S. Cl. 178—69.1 4 Claims



1. A receiver for a data transmission system in which data signals are transmitted in the form of a channel signal which is obtained by means of double sideband quadrature modulation of a carrier wave and in which prior to the data signals a synchronizing sequence is transmitted which comprises a synchronizing period and an immediately subsequent training period for effecting in the receiver an initial synchronization of local oscillators and a correct preadjustment of an adaptive equalizer respectively, the spectrum of the channel signal during the synchronizing period comprising a spectral line at the carrier frequency f_c and two spectral lines located symmetrically relative to f_c, said spectrum during the training period comprising a spectral line at the carrier frequency f_c having a phase which is opposite to that of f_c during the synchronizing period and a plurality of spectral lines which are symmetrical relative to f_c, which receiver comprises a detection circuit means coupled to the receiver input for generating an output signal which starting from a first value assumes a second value during the reception of the synchronizing period and which again assumes the first value on receipt of the training period

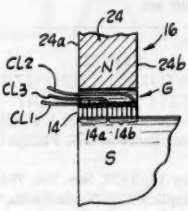
and the subsequent data signals, said detection circuit comprising a bandpass filter means for selecting a channel signal component at f_c, a zero crossing detector means coupled to said filter for generating output pulses at the zero crossings of said channel signal component, pulse interval measuring means having a first and a second output and being coupled to the zero-crossing detector for measuring the interval between successive output pulses thereof to produce a pulse at said first output each time the length of the interval measured is within a predetermined range and to produce a pulse at said second output each time the length of the interval measured is outside said predetermined range, and a pulse pattern analyzer means coupled to said first and second outputs of the pulse interval measuring means to produce said output signal of said first value which after a prescribed pattern of successive pulses has occurred at least once at the first output of the pulse interval measuring means assumes said second value and which again assumes the first value in response to the occurrence of a pulse at the second output of the pulse interval measuring means.

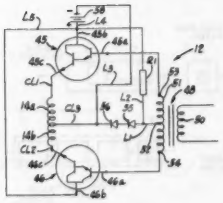
4,130,725

SPLIT-COIL SPEAKER WITH DIRECT COUPLING

Martin J. Nagel, Russell Township, Geauga County, Ohio, assignor to Tenna Corporation, Warrensville Heights, Ohio

Filed Dec. 2, 1976, Ser. No. 746,796
Int. Cl.[2] H04R 3/00, 9/04
U.S. Cl. 179—1 A **8 Claims**





1. A power amplifier and speaker unit comprising a speaker having a cone, a magnet assembly defining a gap across which a magnetic flux extends to form a magnetic field, two wire coils secured in tandem to said cone and movable axially in said gap, said coils having a combined axial length essentially equal to the length of the useful magnetic field in the direction of the gap depth, and means biasing said coils to a location within the extent of the useful magnetic field; and an amplifier circuit directly coupled to said coils for alternately electrically energizing said coils to move each when energized in a direction further into the magnetic field.

4,130,726

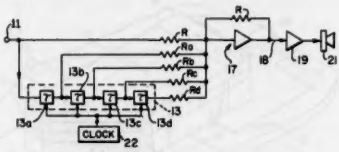
LOUDSPEAKER SYSTEM EQUALIZATION

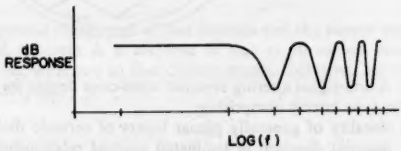
James M. Kates, Norfolk, and Robert A. Berkovitz, Lexington, both of Mass., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Jun. 29, 1977, Ser. No. 811,297
Int. Cl.[2] H04R 3/04
U.S. Cl. 179—1 D **8 Claims**

1. In audio transducer apparatus comprising audio transducer means having an amplitude-frequency response characteristic including plural resonances and drive means for producing electrical driving signals for driving said transducer means responsively to an input audio signal, the improvement wherein said drive means includes

signal delay means for providing a plurality of delayed replicas of said input signal, each replica including a component corresponding to said input signal delayed by a re-





spective delay period substantially equal to half the period of a corresponding one of said resonances;

signal summing means responsive to said input signal and delayed replicas to provide said drive signal as a linear combination thereof, and

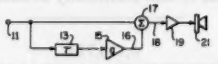
means for reducing the noise with respect to at least the least delayed of said plurality of delayed replicas, whereby substantial equilization of said apparatus is achieved.

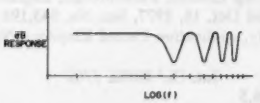
4,130,727

LOUDSPEAKER EQUALIZATION

James M. Kates, Norfolk, Mass., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Jun. 29, 1977, Ser. No. 811,894
Int. Cl.[2] H04R 3/04
U.S. Cl. 179—1 D **24 Claims**



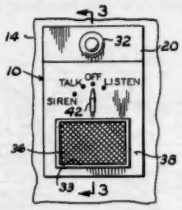


1. Audio transducer system comprising audio transducer means having an amplitude-frequency response characteristic including at least one resonance, and drive means for producing electrical driving signals thereto, said drive means being responsive to an input audio signal to provide said drive signal for the transducer means as a linear combination of said input signal and at least one delayed replica of said input signal, said replica including a component corresponding to said input signal delayed by a delay period substantially equal to half the period of said resonance, whereby substantial equalization of said response characteristic is achieved.

4,130,728
COMBINED MOUNTING FOR THROUGH-THE-WALL VIEWER AND INTERCOM

Stephen L. Grauel, 907 W. Broadway, Ardmore, Okla. 73401

Filed Mar. 23, 1978, Ser. No. 889,789
Int. Cl.[2] H04M 1/00; H04R 1/28
U.S. Cl. 179—1 H 3 Claims



1. An improved through the wall audio visual communication apparatus for a door, or the like, having a one-way viewing tube extending therethrough, the improvement comprising:

a pair of hollow housings containing a two-way communication circuit including a pair of microphone/speakers; a circuit control switch in one of the housings; each housing having a back wall for flatly contacting opposing vertical wall surfaces of said door and each having a centrally apertured flange projecting beyond one end of the housing in the plane of the respective back wall for receiving respective end portions of said one-way tube and securing said housings to said door,

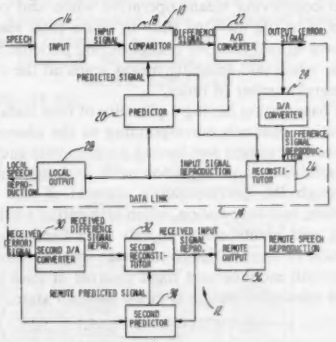
each said housing having an opening in its wall opposite said back wall for the passage of audio waves to and from the microphone/speakers; and,

a circuit control switch arm rotatably mounted on said one housing connected with the circuit control switch.

4,130,729
COMPRESSED SPEECH SYSTEM

Richard T. Gagnon, Rochester, Mich., assignor to Scitronix Corporation, Ann Arbor, Mich.

Filed Sep. 19, 1977, Ser. No. 834,642
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SA 16 Claims



1. A compressed speech system of the type which reduces speech to a minimum of binary digits through prediction of redundency in said speech, said system comprising:

input means operative to receive a speech stimulus and to generate an input signal as a function of said speech stimulus;

predictor means operative for generating a signal predictive of the waveform of said input signal;

comparison means operative to receive and compare said input signal and predictive signal and to generate a difference signal proportional to the difference therebetween;

conversion means operative to receive said difference signal, and to generate a synonymous binary error signal;

reconversion means operative to receive said error signal and to generate a difference signal reproduction, said difference signal reproduction being substantially identical to said difference signal;

and reconstitution means operative to receive said predictive signal and said difference signal reproduction and to generate and input signal reproduction proportional to the sum thereof, said input signal reproduction being substantially identical to said input signal;

said predictor means being operative to receive said error signal and said input signal reproduction, said predictive signal being a function of said error signal and said input signal reproduction.

4,130,730
VOICE SYNTHESIZER

Carl L. Ostrowski, Sterling Heights, Mich., assignor to Federal Screw Works, Detroit, Mich.

Filed Sep. 26, 1977, Ser. No. 836,589
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SM 18 Claims

1. In an electronic device for phonetically synthesizing human speech including

input means responsive to input data identifying a desired sequence of phonemes for producing a plurality of control signals that electronically define each phoneme in said desired sequence of phonemes, including a first control signal for controlling the amplitude of the voiced component of speech and a second control signal for controlling the amplitude of the unvoiced component of speech;

vocal source means for producing a voiced excitation signal;

fricative source means for producing an unvoiced excitation signal; and

vocal tract means responsive to said voiced and unvoiced excitation signals and certain of said plurality of control signals for substantially producing the frequency spectrums of each of said desired sequence of phonemes, including a first resonant filter tunable under the control of a third of said control signals for producing the first formant in said frequency spectrums and a second resonant filter serially connected to said first resonant filter and tunable under the control of a fourth of said control signals for producing the second formant in said frequency spectrums;

the improvement comprising controller means for injecting said voiced and unvoiced excitation signals into said vocal tract means including first controller means for injecting excitation energy in parallel into said first and second resonant filters under the control of said first control signal and second controller means for injecting excitation energy into said vocal tract means under the control of said second control signal.

16. In an electronic device for phonetically synthesizing human speech including

vocal source means for producing a voiced excitation signal;

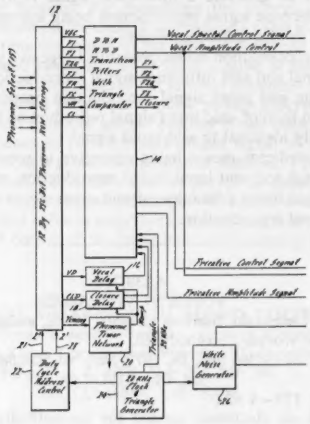
fricative source means for producing an unvoiced excitation signal;

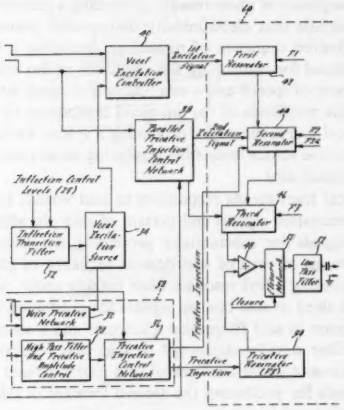
input means responsive to input data identifying a desired sequence of phonemes for producing a plurality of control signals that electronically define each phoneme in said desired sequence of phonemes, including a first control signal for controlling the amplitude of said voiced excitation signal and a second control signal for controlling the amplitude of said unvoiced excitation signal; and

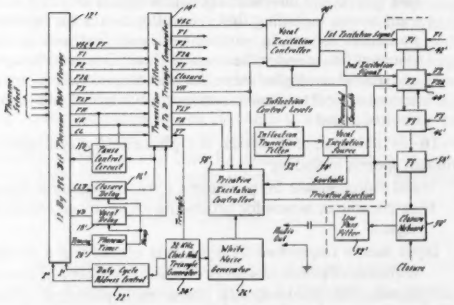
vocal tract means responsive to said voiced and unvoiced excitation signals and certain of said plurality of control

signals for substantially producing the frequency spectrums of each of said desired sequence of phonemes;

the improvement comprising pause control means connected to said input means for producing an output signal







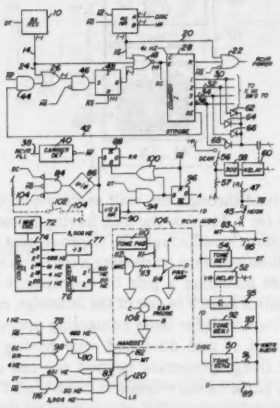
that is effective to cause said input means to maintain the current values of certain of said control signals beyond the normal phoneme period whenever both said first and second control signals are absent.

4,130,731

PORTABLE TELEPHONE SYSTEM

Duane R. Bolgiano, Bala Cynwyd; Joel M. Benjamin, Jr., Pottstown, and Victor Meyer, Jr., Telford, all of Pa., assignors to International Mobile Machines Incorporated, Bala Cynwyd, Pa.

Filed Dec. 29, 1976, Ser. No. 755,615
Int. Cl.[2] H04Q 7/04
U.S. Cl. 179—2 EB **22 Claims**



1. A portable telephone system comprising:

at least one subscriber station having a transmitter, a receiver, a control section, and a plurality of communication channels, said control section including scanning means and means to monitor for identification signals specific to said subscriber station, said scanning means when activated, causing said receiver to be tuned sequentially to each channel for a specific interval of time,

said control section further having a monitor state for causing all said channels to be monitored periodically for said identification signals, an originate state for causing all said channels to be monitored periodically until a channel having no carrier thereon is found, and an active state for causing said transmitter and said receiver to remain tuned to one channel,

power-conserving means operative when said control section is in the monitor state to cause total suspension of power to said receiver except during periodic intervals of time when said scanning means scans all the channels an integral number of times,

and a base station having a plurality of base station communication channels corresponding to the channels of said subscriber station and having a transmitter and a receiver to establish communication with said subscriber station through the corresponding channel at said subscriber station, said base station, when originating a call, transmitting said identification signals on a fixed channel for a period of time sufficient to insure that the subscriber station will monitor said fixed channel at least once when said subscriber station is in the monitor state.

4,130,732

REMOTE ALARM RESET APPARATUS

George Giovagnoni, 1228 Wantagh Ave., Wantagh, N.Y. 11793

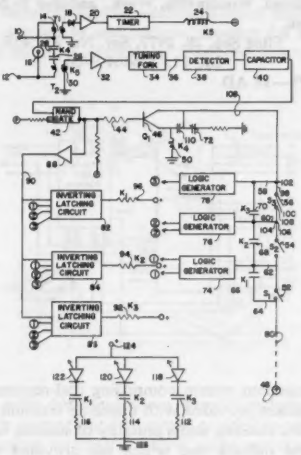
Filed May 12, 1977, Ser. No. 796,326
Int. Cl.[2] G08B 19/00; H04Q 9/00
U.S. Cl. 179—5 R **7 Claims**

1. In a burglar alarm apparatus having a series circuit including a plurality of switch sensing elements and an electrical device energized when said plurality of switch sensing elements are in a closed condition, and a pair of wires utilized in

a telephone communication system, the improvement comprising:

a. first means responsive to a ringing signal transmitted over said pair of wires for energizing a first relay for a predetermined time period,

b. second means responsive when said first relay is energized only to a coded tone signal transmitted over said pair of wires for producing an enabling voltage, said enabling voltages being produced only after said electrical device is de-energized,



c. third means for detecting the position of each of said plurality of switch sensing elements,

d. fourth means for initially applying a bridging short circuit across those of said plurality of switch sensing elements which are open circuited when said open circuited condition and said enabling voltage occur simultaneously,

e. fifth means for indicating the location of said open circuited condition, and

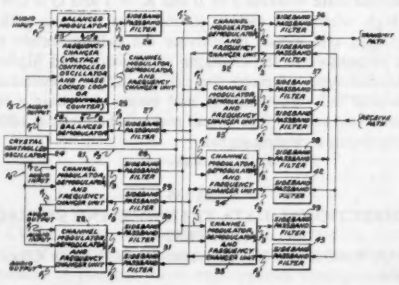
f. sixth means for maintaining said bridging short circuit after said enabling voltage is reduced to zero.

4,130,733

FREQUENCY CHANNEL UNITS FOR A FDM SYSTEM

Donald A. Ashford, Stamford, Conn., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Jan. 10, 1977, Ser. No. 758,107
Int. Cl.[2] H04J *1/06*
U.S. Cl. 179—15 FD **21 Claims**



1. In a frequency division multiplex (FDM) system, a plurality of FDM frequency channel units each comprising:

first means responsive to a single reference signal having a predetermined first frequency, said reference signal being coupled in common to all of said units to produce a carrier signal having a different predetermined second frequency in each of said units; and

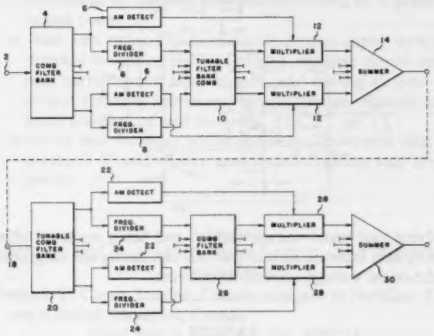
second means directly coupled to said first means and an audio input to modulate and to transmit an associated one of said carrier signals with audio information.

4,130,734

ANALOG AUDIO SIGNAL BANDWIDTH COMPRESSOR

Harry T. Lee, Sunnyvale, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Dec. 23, 1977, Ser. No. 863,959
Int. Cl.[2] H04J *3/18*; G10L *1/00*
U.S. Cl. 179—15.55 R **11 Claims**



1. An analog bandwidth compressor comprising:

means for separating incoming voice signal energy into individual channels,

first and second means connected to each of said individual channels,

each of said first means providing an output having a magnitude representative of the magnitude of the signal received from its respective individual channel,

each of said second means providing an output having a frequency equal to the output frequency of the respective separating means times a predetermined constant, where said constant is less than one,

tunable filter means for suppressing harmonic distortions connected to the output of said second means,

multiplier means connected to each of said first means and the respective output of said filter means for superimposing the magnitude information onto the respective frequency output from said filter means,

summing means attached to the output of each of said multiplier means for summing said outputs from the multiplier means and providing an output signal having reduced signal bandwidth from that of the original input signal to said bandwidth compressor.

4,130,735

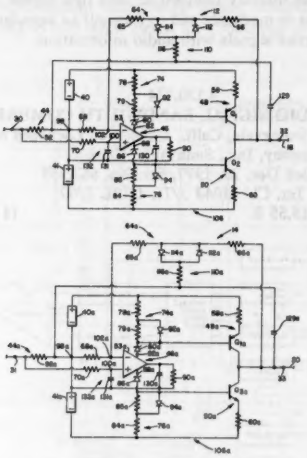
LOOP EXTENDER

Charles W. Chambers, Jr., Amherst; Frederick J. Kiko, Lorain, and Robert J. Kretschmann, Elyria, all of Ohio, assignors to Lorain Products Corporation, Lorain, Ohio

Filed Apr. 11, 1977, Ser. No. 786,563
Int. Cl.[2] H04Q *1/30*
U.S. Cl. 179—16 F **26 Claims**

1. A voltage booster for supplying a d.c. boost voltage to a two wire transmission line in a telephone system and comprising a d.c. voltage supply, an amplifier circuit cooperating with said voltage supply for developing said boost voltage, feedback means connected to said amplifier circuit for controlling the gain of said amplifier circuit, and means connected to and cooperating with said feedback means for increasing said gain in response to a rise in the magnitude of direct current flowing

in said line above a pre-selected threshold, and said amplifier circuit having means providing a connection to said line for



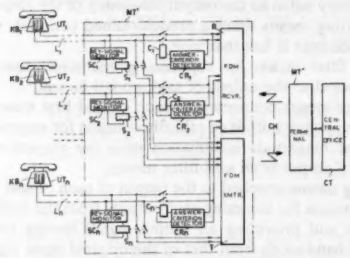
applying said boost voltage thereto and being rendered effective by said increase in said gain for increasing the magnitude of the boost voltage applied to said line.

4,130,736

TELECOMMUNICATION SYSTEM WITH KEYBOARD SELECTION

Franco De Marco, and Constantino Panzeri, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.P.A., Milan, Italy

Filed Nov. 22, 1977, Ser. No. 853,853
Claims priority, application Italy, Nov. 24, 1976, 29654 A/76
Int. Cl.[2] H04M *3/00*
U.S. Cl. 179—16 EC **5 Claims**



1. In a telecommunication system comprising a two-way communication channel extending between a terminal and a remote exchange, and a multiplicity of local lines linking said terminal with subscriber stations equipped with multifrequency generators for the emission of selection signals accompanied by a key signal not transmissible over said channel, said channel having an incoming branch and an outgoing branch both normally disconnected from said subscriber lines,

the improvement wherein said terminal includes monitoring means connected to said local lines for detecting the arrival of a key signal from any calling subscriber station and call-extending switch means controlled by said monitoring means for connecting the line of the calling subscriber to an outgoing branch of said channel normally disconnected therefrom, and

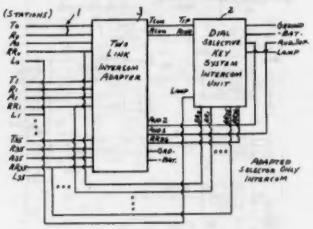
detector means at said terminal responsive to an answer criterion from the exchange and other switch means controlled by said detector means for extending said incoming branch to the line of the calling subscriber already connected to said outgoing branch, said monitoring means and detector means being responsive to a call-terminating signal for restoring the switch means controlled thereby to disconnect the line of the calling subscriber from both said branches.

4,130,737

TWO-LINK INTERCOM SYSTEM

Barry C. Breen, Woodinville, Wash., assignor to Melco, Bellevue, Wash.

Filed Sep. 28, 1977, Ser. No. 837,410
Int. Cl.[2] H04M *9/06*
U.S. Cl. 179—18 AD **23 Claims**



1. An intercom system comprising dial-responsive station-selecting means provided with means to transmit ringing signals to called stations, and a plurality of stations which can go offhook and onhook and which are provided with dialing means for calling stations in the system, first link circuit means normally connected to all said stations, second link circuit means normally connected to said selecting means and defining an exclusive talk path, link-selecting means to connect a calling station and a called station via said second link circuit means responsive to the establishment of a first call by the calling station to the called station when the system is idle, leaving the first link circuit means available on a non-exclusive basis for subsequent calls between the other stations of the system, wherein said link-selecting means comprises respective relay means connected to the stations, means to switch the stations from said first link circuit means to said second link circuit means responsive to activation of said respective relay means, respective station relay activating means comprising a J-K flipflop having J and K inputs and Q and $\overline{Q}$ outputs, means establishing a first state of the flipflop wherein J = 1 and K = 0 and Q is high and $\overline{Q}$ is low, means normally holding the associated station relay means deenergized in said first state of the flipflop, whereby all onhook stations are connected to the first link means, means changing the flipflop of a calling station to a second state wherein J = 0 and K = 1 and Q is low and $\overline{Q}$ is high when said calling station goes offhook with the system idle, and means to activate the calling station relay means responsive to the changing of its associated flipflop to said second state, whereby the calling station is switched to said second link circuit means, and means switching a called station to said second link circuit means when it goes offhook after receiving a ringing signal.

4,130,738

BIDIRECTIONAL DATA TRANSFER AND STORAGE SYSTEM

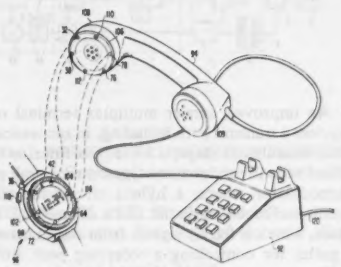
Gary O. Sandstedt, 3837 Harrison Blvd., Kansas City, Mo. 64109

Continuation-in-part of Ser. No. 694,660, Jun. 10, 1976, abandoned. This application Sep. 20, 1977, Ser. No. 834,911
Int. Cl.[2] H04M *1/42*
U.S. Cl. 179—90 B **38 Claims**

27. A bi-directional data transfer and storage system for on-line communication with telephone apparatus wherein

selected data from telephone apparatus is first fed to a portable random access memory which subsequently operates on demand to display said data and/or output selected storage data to external means for dialing a telephone and when desirable thereafter communicating data over a telephone channel, the improvement comprising:

a device carried or worn by the user including a casing, said random access memory housed within said casing, said memory having a plurality of selectable memory addesses for storing respective data signals thereat, address circuitry therefor, manual address selector means on said casing coupled to said address circuitry for accessing a desired memory address, at least one electromagnetic



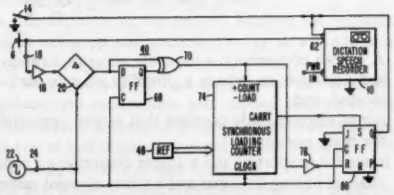
energy input communications channel including electromagnetic energy coupling means coupled to said memory for coupling externally applied alpha-numeric data and clock signals thereto for reading selected data signals into a desired address of said memory under the control of said clock signals, an internal source of clock signals and at least one electromagnetic energy output communications channel also including electromagnetic energy coupling means coupled to said memory and said internal source of clock signals for reading out on demand selected data signals from a desired address of said memory and coupling said data signals and said clock signals to said external means.

4,130,739

CIRCUITRY FOR COMPRESSION OF SILENCE IN DICTATION SPEECH RECORDING

Michael A. Patten, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1977, Ser. No. 804,955
Int. Cl.[2] G11B *19/02, 5/00*
U.S. Cl. 179—100.1 VC **9 Claims**



1. Circuitry for the compression of silence in dictation speech and like electric wave recording apparatus, comprising

a source of electric waves representing intelligence sound separated by silence periods,

a recorder of said electric waves having a sound wave input terminal to which said source is coupled, and having electrically controllable transducing apparatus for making a record on a record medium and having an input terminal at which a control electric level is to be applied,

a source of clocking wave,

a delta modulator circuit having a carrier wave input terminal to which said source of clocking wave is connected, signal wave input terminals connected to said sound wave input terminals and a binary data output terminal,

one flip-flop circuit having input terminals connected to said binary data output terminal and to said carrier wave input terminal, and having an output terminal,

an eXclusive OR (XOR) gating circuit having one input lead connected to said binary data output terminal, another input lead connected to said output terminal of said flip-flop circuit, and having an output lead, and

a counting circuit coupled to said output lead of said XOR gating circuit and having at least one output lead for producing an electric potential indicative of a predetermined count,

at least one other flip-flop circuit having input terminals coupled to said output lead of said counting circuit and to said carrier wave input circuit, and having at least one output terminal connected to said control electric level input terminal of said recorder,

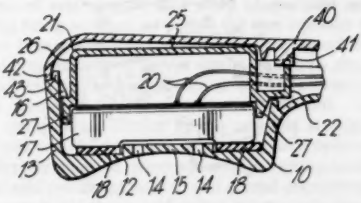
whereby said recorder is controlled in accordance with the presence of said silence periods interrupting said intelligence.

4,130,740

TELEPHONE HANDSET WITH ROTATABLY LOCKING RECEIVER

Fredrick T. Cogan, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 9, 1978, Ser. No. 876,211
Int. Cl.[2] H04M *1/03*
U.S. Cl. 179—103 **15 Claims**



1. A telephone handset having an elongate top part and an elongate lower part, each part of hollow concave form and adapted to fit together at their peripheries, said lower part housing a receiver and a transmitter; said lower part formed at one end to define a circular recess having a perforated base and a side wall extending upward from said base; a receiver positioned in said recess and facing towards said base; a cover member fitting on said receiver and rotatable about a central axis in said recess; and interengaging formations on said cover and on an inner surface of said side wall, whereby on rotation of said cover member said formations of the cover member engage with said formations on the inner surface of the side wall and lock the cover member and receiver in position.

4,130,741

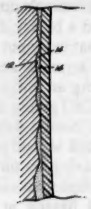
HEARING AID RELINER AND APPARATUS FOR RELINING HEARING AID EAR MOLDS

Benjamin Gottlieb, 3760 Royal Palm Ave., Miami Beach, Fla. 33140

Filed Jan. 19, 1978, Ser. No. 871,090
Int. Cl.[2] H04R *1/10, 25/00*
U.S. Cl. 179—107 E **6 Claims**

1. The process of relining an ear mold sized to fit the ear canal of a particular wearer which comprises the steps of applying a coating to the exterior surface of the ear mold wherein said coating comprises an adhesive of flowable mate-

rial and inserting the coated ear mold into the ear canal wherein the coating comprises means for effecting a seal be-



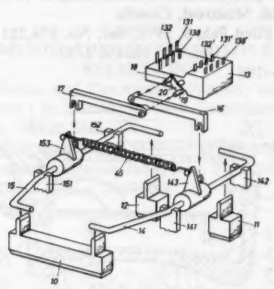
tween the surface of the ear mold and the tissues within the ear canal to reduce feedback.

4,130,742

SWITCH ACTUATOR FOR ONE-PIECE TELEPHONE

Borje L. Lindman, Tyreso, and Carl-Axel Stromer, Bromma, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 16, 1977, Ser. No. 778,063
Claims priority, application Sweden, May 3, 1976, 76050343
Int. Cl.[2] H04M *1/08*
U.S. Cl. 179—167 **7 Claims**



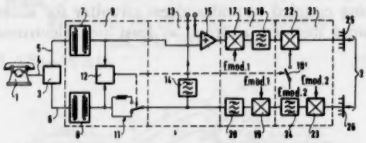
1. A switch actuating device for a telephone instrument of the one-piece type having a base portion with a flat base surface and including a contact switch assembly for deactivating and activating the telephone instrument by placing the instrument upon a support surface and lifting the instrument respectively, said device comprising: spaced apart actuating members protruding from said flat base, each of said members being axially displaceable and biased to protrude from said flat base surface upon lifting of the instrument; and switch actuating means coacting with said axially displaceable actuating members for closing the contact switch assembly upon lifting of the telephone instrument and opening the contact switch assembly upon placing the instrument upon a support, said contact switch actuating means comprising elongate links coacting with each of said actuating members, a plurality of mounting means each supporting one of said links rotatable about its lengthwise axis; and spring means coacting with said links for biasing the same into a position in which one end of each of said links coacts with one of said axially displaceable actuating members for turning the respective links in response to the displacement of the respective link ends; and transmission means coupled with the other end of the links and with the contact switch assembly so that inward displacement of any of said actuating members causes opening of the contact switch assembly and displacement of all said actuating members into the outward position causes closing of the contact switch assembly.

4,130,743

TERMINAL EQUIPMENT FOR A MULTIPLEX CARRIER CURRENT TELEPHONE SYSTEM

Claude Boulanger, Chevilly Larue, and Christian Poinas, Boulogne, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Aug. 2, 1977, Ser. No. 821,218
Claims priority, application France, Aug. 24, 1976, 76 25577
Int. Cl.[2] H04B *3/24*
U.S. Cl. 179—170.2 **3 Claims**



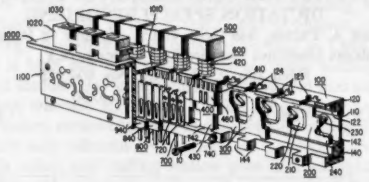
3. An improved carrier multiplex terminal of a type that comprises a transmit path including, in succession, a first and a second modulation stage; a band-pass filter intermediate said first and second modulation stages; a receiving path including a demodulator means; a hybrid circuit for combining said transmit and receiving paths; and a differential, half-echo suppressor, which is fed by signals from said transmit and receiving paths, for controlling a receiving path attenuator and a blocking means, said blocking means comprising a switch which is situated in the carrier input line to said second modulation stage, wherein said attenuator and said blocking means are activated during that interval of time wherein the speech level from the local subscriber exceeds the speech level from a distant subscriber.

4,130,744

CAM ACTUATED MULTIPLE CONTACT SPRING SWITCH

Robert L. Beecher, II; Harold J. Hershey, and Robert S. Zieles, all of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 25, 1977, Ser. No. 790,461
Int. Cl.[2] H01H *1/28, 9/00*
U.S. Cl. 200—1 A **13 Claims**



1. A switch comprising: a movable actuator having
a body portion on which a plurality of cam surfaces are located, and
a pair of aligned guide portions that extend oppositely from the body portion;
a frame for supporting the actuator comprising a rigid metal channel having an upper and a lower element respectively molded to the extremities thereof, the upper and lower element each including a notch, the notches being aligned with one another and accommodating the guide portions of the actuator and cooperating with the guide portions to direct the movement of the actuator; and
a first and second contact spring positioned adjacent to one another, each contact spring being associated with an individual cam surface of the actuator and at least one contact spring being deflected responsive to the movement of the actuator, each contact spring being associated

with a cam follower in the proximity of one end thereof that extends into juxtaposition with the associated cam surface of the actuator and each contact spring having a mounting element molded thereon in the proximity of the other end thereof, the mounting elements of the contact springs being positioned in engagement with one another and secured to the frame and serving to orient the contact springs at a particular angle with respect to one another and with respect to the cam surfaces of the actuator, and the cam followers in combination with the associated cam surfaces serving to locate and provide a predetermined bias to the contact springs.

4,130,745

DIFFERENTIAL PRESSURE THRESHOLD DETECTOR

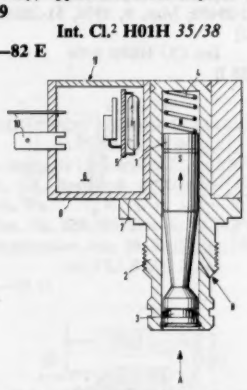
Fritz Hetzer, Isny, Germany, assignor to Purolator Filter G.m.b.H., Germany

Filed Aug. 23, 1977, Ser. No. 828,169

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640529

Int. Cl.[2] H01H *35/38*

U.S. Cl. 200—82 E **2 Claims**



1. A differential pressure threshold detector comprising a control magent and a reed switch actuated thereby having two contact reeds, characterised by the features:

(a) a first housing,

(b) a reed switch mounted within said housing,

(c) a second housing, a portion of which is formed as a guide capable of entering an aperture in the first housing when the latter is pushed onto said guide,

(d) a stop element in said second housing for locating the first housing on said second housing in a predetermined position, and

(e) a control magnet for said reed switch movable along a displacement path within said second housing in dependence upon a differential pressure applied to said magnet, the axis of said displacement path being parallel to a plane containing the axis of said reeds,

(f) said first housing containing the reed switch being pushable on to the guide of the second housing according to choice in one of two positions turned through 180° about an axis lying perpendicularly of the axis of the displacement path,

(g) said reed switch being disposed in relation to the axial dimension of the first housing, eccentrically therein in such a way that the mode of operation of the reed switch as an off-on switch or an on-off switch is determinable by the selection of said positions.

4,130,746

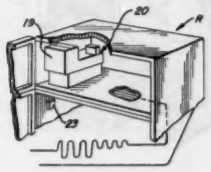
SNAP-ACTION CAM FOR TIMER SWITCH

William J. Linstromberg, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 11, 1977, Ser. No. 786,564

Int. Cl.[2] H01H *43/10*; G05D *23/32*; F16H *53/00*; H01H *3/32*

U.S. Cl. 200—38 R **17 Claims**



1. In a control having an electrical switch, a first spring means for biasing the switch to a first operational condition, a switch actuator biased by the spring means to a first disposition when the switch is biased to said first operational condition, a cam follower, and means responsive to selective urging of the spring biased switch actuator to said first disposition to urge said cam follower in a first direction, the improvement comprising:

drive means;

a single cam driven by said drive means and having a first portion selectively engaged by said urged cam follower to oppose said urging of the cam follower by the switch actuator spring means and dispose said switch actuator in a second disposition causing the switch to be in a second operational condition, and a second portion with which the cam follower becomes associated as a result of the driving of said cam by said drive means, said second portion being arranged to permit the cam follower to be moved in said first direction by said spring biased switch actuator sufficiently to permit said switch to be disposed in said first operational condition during a preselected timed portion of the driven cam movement; and

second spring means carried by the cam and arranged to urge said cam follower in a second direction opposed to said first direction to overcome said first spring means to return said switch actuator to said second disposition and correspondingly throw said switch substantially instantaneously to said second operational condition.

4,130,747

MINIATURE OVERTRAVEL SNAP ACTION SWITCH WITH PIVOTAL CAM MOUNTING FOR THE SWITCH BLADE

John S. Resh, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

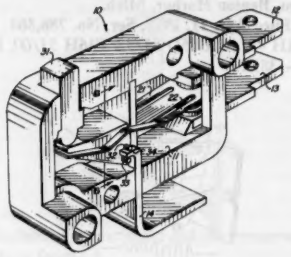
Filed Oct. 12, 1977, Ser. No. 841,477

Int. Cl.[2] H01H *21/04*

U.S. Cl. 200—67 D **8 Claims**

1. In a snap action overcenter type switch including a tensionable switch blade having two oppositely disposed end portions, a stationary mount having oppositely disposed faces for mounting said switch blade in said switch, with one end portion of said switch blade being in operative connection with one of said faces of said stationary mount in a fixed pivot mounting and the other of said faces of said stationary mount having a non-recessed portion, said other end portion of said switch blade being in operative connection with said other face of said mount at said non-recessed portion, the improvement comprising said latter operative connection which comprises a cam with a cam edge having a portion thereof of a rounded configuration which engages said other face of said stationary mount in a rolling movement, said cam connecting with said switch blade at a portion thereof displaced from said cam edge, with said cam edge in the operation of said switch rolling over

a linear dimension longitudinally of said other face at said non-recessed portion and pivoting at a plurality of points over



said linear dimension, and said cam correspondingly moving said switch blade upon said rolling movement of said cam edge.

4,130,748

PLUG-TYPE SWITCH

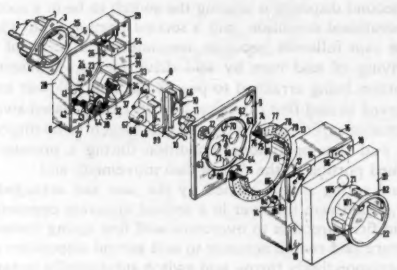
Lukas Schwer, Haigerloch, Germany, assignor to Theben-Werk Zeitautomatik GmbH & Co. KG., Germany

Filed Mar. 17, 1977, Ser. No. 778,590

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611154

Int. Cl.² H01H *43/00*

U.S. Cl. 200—38 D **11 Claims**



1. An electric power supply operated switch clock for an appliance plug, comprising a housing, constant speed drive motor means in said housing, a plug head mounted in said housing adjacent a back wall thereof and centrally located in said back wall having pin contacts adapted to be engaged in the power supply and being connected to said drive motor means, a plug socket in said housing coaxial with and spaced from said plug head adjacent an opposite front wall of said housing having pin bushings axially aligned with said pin contacts and a socket cup having an opening in said front wall for receiving the appliance plug, a switch ring rotatably mounted in said housing coaxially disposed about said plug socket for timed rotary movement about said plug socket connected to said drive motor means for rotation thereby, a quick-break switch gear in said housing outside said switch ring including at least one pair of switch contacts connected between at least one of said pin contacts and at least one of said pin bushings, said switch ring having an annular shoulder with a plurality of switch rider receiving bores which are angularly equidistantly spaced from each other in said annular shoulder, at least one switch rider in at least one of said receiving bores, said quick-break switch gear having a switching element disposed in the path of movement of said at least one of said switch riders for actuation of movement of said switch rider with said switch ring to make and break contact between said pair of switch contacts, said housing being substantially square in shape with the diameter of said switching ring being slightly smaller than the length of a side of said housing, said drive motor means including a synchronous motor, a timer mechanism having a pinion gear connected between said synchronous motor and said switch ring to rotate said switch ring at a constant timed speed and accommodate it in said housing between said plug head and said plug socket and connected between said plug head and said plug socket, a substantially cylindrical guide body located within said switch ring and connected thereto and extending axially beyond each end thereof with one end portion having a toothed rim engaged with said pinion gear of said timed mechanism and its opposite end portion having an outer grip surface, said housing including a partition wall with a circular rib extending therefrom, said switch ring engaged over and guided for rotation on said rib and said cylindrical guide body engaged around and guided for rotation on said socket cup, said synchronous motor, timing mechanism and quick-break switch gear being disposed around said plug socket in said housing.

4,130,749

MICROWAVE OVEN

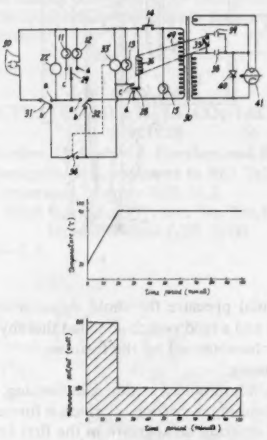
Junzo Tanaka, Fujiidera; Masatomo Orita, and Chikao Urashima, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 4, 1977, Ser. No. 774,340

Claims priority, application Japan, Mar. 9, 1976, 51-26426; Mar. 17, 1976, 51-29491; Mar. 9, 1976, 51-28884[U]; Sep. 2, 1976, 51-118568[U]

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 B **9 Claims**



1. A microwave oven of the type including

a heating chamber and means for the closing thereof;

a microwave generator for generating microwave energy inside said heating chamber, output controlling means for changing the microwave power output level of said microwave generator, and timer means, cooperating with said output controlling means, and adapted to cooperate with a power supply, for selectively applying power to said microwave generator, wherein:

said timer means comprises:

a first timer motor for defining a first time period;

first and second change-over switches, each having, a pole and first and second contacts and both responsive to said first timer motor, the pole of said first change-over switch being adapted for connection to said power source, said second contact of said first change-over switch being connected to said first timer motor and said second change-over switch second contact, respectively, and said second change-over switch pole being coupled to said

microwave generator, selectively connecting, thereby, said first timer motor and said microwave generator to said power source;

a second timing motor connected to said second change-over switch first contact;

a normally off switch coupling said respective first and second change-over switch first contacts, said normally off switch being responsive to said second timer motor and closed in response to the energization of said second timer motor;

a cooking selection dial having indications of kinds of foods and cooking operations and amounts thereof and having a pointer movably linked to said change-over switches;

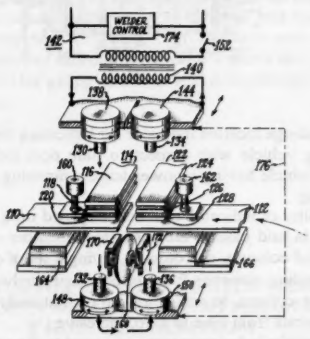
cooperating with said timer motors for initially setting said first and second timer motors and said first and second change-over switches in accordance with a desired cooking operation; and

switch means for effecting switching of said output controlling means, said switch means being linked with said cooking selection dial and responsive to the selection of a desired cooking operation.

4,130,750
MACHINE FOR WELDING ALUMINUM TO ALUMINUM

Moreland P. Bennett, Hickory, N.C., and William L. Bowers, Shreveport, La., assignors to General Electric Company, Philadelphia, Pa.

Division of Ser. No. 638,300, Dec. 8, 1975, Pat. No. 4,048,463. This application Jun. 28, 1976, Ser. No. 700,609
Int. Cl.² B23K *11/16*
U.S. Cl. 219—78.15 **3 Claims**

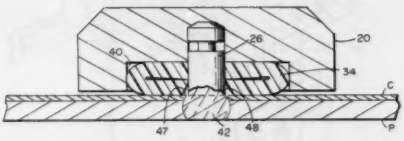


1. A machine for welding a pair of aluminum leads to an aluminum coil comprising two pairs of opposed electrodes made of hard, high-electrical resistance material mounted in holders, said electrodes being formed of a material selected from the group consisting of molybdenum, tungsten, and alloys thereof, means for moving each said pair of opposed electrodes toward and away from each other, means for connecting one electrode of each said pair to the secondary of a welding transformer, means connecting the other electrode of each said pair in electrical series circuit, means for mounting a portion of an aluminum coil between the opposed electrodes of each said pair, and means for severing said portion of said aluminum coil between said pairs of opposed electrodes.

4,130,751
METAL ORNAMENTATION AND METHOD OF WELDING

Stanley H. Gordon, 75 Laurel St., Concord, Mass. 01742

Filed Nov. 1, 1976, Ser. No. 737,169
Int. Cl.² B23K *9/20*
U.S. Cl. 219—98 **7 Claims**



1. A part structure adapted for attachment to an underlying metal surface by electric welding, comprising

a metallic, electrically conductive body member having an exterior side and an interior side, said interior side having a continuous outer edge adapted for contact with said metal surface and a central recess spaced within said outer edge

a metallic weld stud permanently mounted in said body member at one end thereof within said recess and spaced from said continuous outer edge of said interior side with its free end extending beyond said interior side of said body member for contact with said metal surface prior to contact therewith by said outer edge of said body member

a resilient and deformable elastomeric seal element surrounding said weld stud and having one end thereof in contact with the bottom wall of said recess and the other end adjacent the end of said weld stud for contact with said metal surface substantially simultaneously therewith, said seal element having a substantial volume less than that of said recess

whereby, upon application of electrical current and mechanical force to the exterior side of said body member, said free end of said weld stud will contact said metal surface for electrical connection and welding of said stud to said metal surface while said seal element continuously deforms within said recess to maintain a resilient seal in contact with said underlying surface around said weld stud and the weld produced thereby providing containment of welding products during the welding cycle while said outer edge of said interior side of said part structure moves toward said metal surface as said weld stud shortens and thereafter.

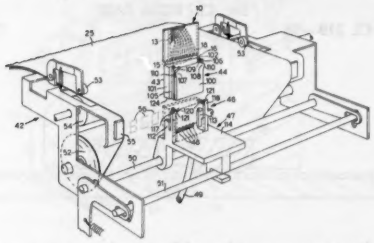
4,130,752
ELECTROTHERMAL PRINT HEAD

Renato Conta, Ivrea (Turin); Lucio Montanari, Cascinette (Turin), and Riccardo Brescia, Ivrea (Turin), all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 675,352, Apr. 9, 1976, Pat. No. 4,055,743, which is a division of Ser. No. 512,564, Oct. 7, 1974, Pat. No. 3,967,092. This application Aug. 11, 1977, Ser. No. 823,658
Claims priority, application Italy, Oct. 23, 1973, 70117 A/73
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **5 Claims**

1. A thermal print head for the non-impact printing of dot matrix characters on a heat sensitive medium comprising: a support provided with an electrically insulating surface, a single heating strip of resistive material on said surface, a pattern of conductors on said surface for selectively energizing and heating segments of said strip and including a first group of conductors extending transversely and spaced along one side of the strip and contacting the strip and a second group of conductors extending transversely and spaced along the other side of the strip and contacting the strip in an interleaved relationship to the conductors of the first group wherein each

conductor of the second group is partly opposed to two adjacent conductors of the first group and each resistive segment of said strip lying between a given conductor of the first group



and a given conductor of the second group is selectively heated upon application of an electric voltage between the given conductors.

4,130,753

CONTROL SYSTEMS

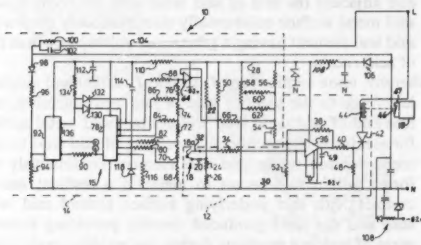
Kenneth R. Wade, Parbold, England, assignor to Pactrol Controls Limited, England

Filed Jul. 13, 1976, Ser. No. 704,891

Claims priority, application United Kingdom, Jul. 15, 1975, 29537/75

Int. Cl.[2] H05B *1/02*

U.S. Cl. 219—492 **28 Claims**



1. A control system comprising a sensor for monitoring a selected variable and providing an electrical signal which is a function of said variable; a reference source including an electronic timing circuit comprised of buffer means and a counting circuit having a plurality of outputs coupled by said buffer means to an output of the reference source and triggerable to progressively increase the output voltage of the buffer means to provide a reference signal at said output of the reference source which varies in a predetermined step-wise manner over a predetermined time period; and a comparator circuit coupled to said sensor and said reference source and operable to compare said electrical signal with said reference signal and provide a control signal in dependence upon the comparison.

4,130,754

PARTICLE COUNTING

Egil Fosslien, Tampa, Fla., assignor to Cortex Research Corporation, Tampa, Fla.

Filed Jun. 16, 1977, Ser. No. 807,251

Int. Cl.[2] G06M *11/00*; G01N *27/10*

U.S. Cl. 235—92 PC **49 Claims**

1. Apparatus for counting particles, such as blood cells, suspended in a liquid medium, comprising:

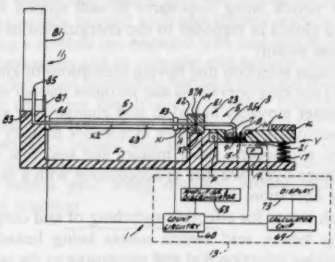
a chamber for receiving a sample of the liquid medium containing suspended particles;

a conduit for flow of the sample from the chamber;

means normally closing the conduit adapted to be opened for flow of the sample therethrough;

means for drawing the sample through the conduit concurrently with opening of said conduit-closing means;

means for counting particles in the sample as it flows through the conduit; and



manually operable means for opening said conduit-closing means for flow of a sample therethrough and concomitantly actuating the counting means to count the particles in the sample flowing through the conduit.

4,130,755

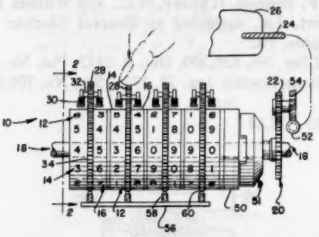
CB TWENTY METER

Nathaniel E. Schochat, 620 Forest Hill Rd., Macon, Ga. 31204

Filed Oct. 5, 1976, Ser. No. 729,829

Int. Cl.[2] G01C *27/00*

U.S. Cl. 235—95 R **4 Claims**



1. A mileage location indicator for indicating the position of a moving vehicle with respect to mile post indicators in a moving vehicle having a power train comprising:

a casing;

a plurality of indicator members disposed on a longitudinal axis in said casing, each indicator member containing a pair of columns, one column having a set of continuously ascending numerals from zero to nine, inclusive, and the other column having a set of continuously descending numerals from nine to zero, inclusive;

tens-transfer indexing means connected to the power train of the vehicle and said indicator members for indexing said indicator members after each unit of distance has been traversed by the vehicle;

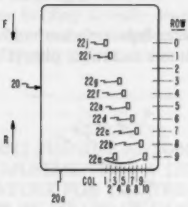
shutter means disposed in said casing for longitudinal movement thereon along said axis, said shutter means containing a single aperture for each of said indicator members, whereby when said shutter means is in a first position, a single numeral of only each ascending column is displayed and when said shutter means is in second position, a single numeral of only each descending column is displayed; and

manual indexing means engageable with each of said indicator members for setting each of said indicator members to a specific numeral determined by the mile post indicators.

4,130,756
ENCODING MECHANISM FOR HOLED BADGE READERS

Richard L. Arndt, Byron; Wilfred L. Meyerhofer, Jr., Oronoco, and David M. Steinbauer, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1976, Ser. No. 735,858
Int. Cl.[2] G06K *7/016, 13/04, 7/10*
U.S. Cl. 235—474 3 Claims



1. A reader for reading data representative sensor actuating elements of a badge which are disposed in equally spaced rows extending across the badge, said reader comprising:

a row of data reading sensors actuated by the sensor actuating elements of the badge as it passes across the sensors in moving in a certain direction,

a carriage movable with the badge as it passes across said sensors,

encoding mechanism actuated by said carriage and including a stationary encoder bar and a pair of control sensors carried by said carriage, said encoder bar including two parallel rows of sensor actuating bar portions defined by holes in said bar, said control sensors being respectively in registry with said two rows of bar portions as said carriage moves along with the badge as the badge passes across said sensors and being in a row extending at right angles to said direction, said bar portions having the same lengths and spacings in said two rows and having spacings on their centers double the spacings on centers of said rows of sensor actuating elements of the badge and being staggered for a distance of less than one-half of the lengths and spacings of said bar portions in either of said rows, and

means connected with said control sensors and effective when either of said control sensors is active and the other is inactive for gating data from said data reading sensors at that time.

4,130,757
APPARATUS FOR MICROSCOPICALLY VIEWING A SPECIMEN WHILE DETECTING RADIATION PARTICLES THEREFROM

Wallace G. Frasher, Pasadena; Daniel J. Netto, and Carol S. Marcus, both of Los Angeles, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

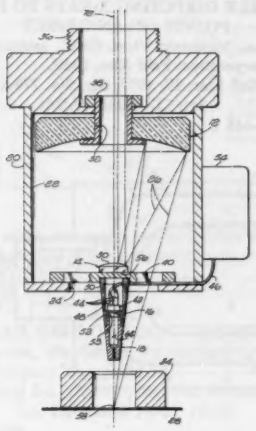
Filed Jun. 28, 1977, Ser. No. 810,707
Int. Cl.[2] G01J *1/00;* G01N *23/00;* G02B *7/00*
U.S. Cl. 250—336 21 Claims

1. Apparatus for detecting species of radiation from a specimen while microscopically viewing the specimen, comprising:

a primary mirror for receiving light directly from a specimen;

a secondary mirror positioned to receive light on a first side from the specimen reflected from said primary mirror and to reflect it for viewing; and

a detector for said radiation species disposed on the opposite side of said secondary mirror to receive said radiation species directly from the specimen.

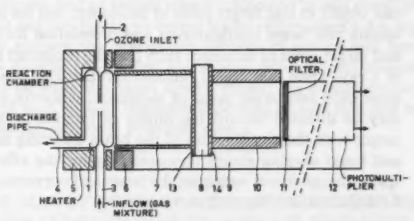


2. The apparatus of claim 1 wherein said detector is disposed substantially in the optical shadow of said secondary mirror.

4,130,758
DEVICE FOR DETERMINING GASEOUS COMPONENTS

Sybrandus van Heusden, and Leonardus P. J. Hoogeveen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,100
Claims priority, application Netherlands, Apr. 21, 1976, 7604197
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—361 C 5 Claims



1. A device for determining the concentration of vaporous components in a gas current, comprising

(a) a reaction chamber, comprising an inlet pipe for ozone, an inlet for the gas mixture to be analyzed, which inlets end close to one another, a discharge for the reacted gases and means for heating the reaction chamber, wherein said device is constructed such that the ozone is introduced so that heating of the ozone does not take place until said ozone is in situ for the reaction,

(b) a photoelectric measuring cell and

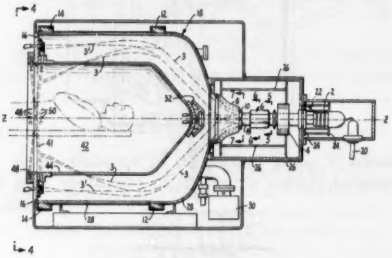
(c) means for interposing at least one optical filter.

4,130,759

METHOD AND APPARATUS INCORPORATING NO MOVING PARTS, FOR PRODUCING AND SELECTIVELY DIRECTING X-RAYS TO DIFFERENT POINTS ON AN OBJECT

Jacob Haimson, Mountain View, Calif., assignor to Haimson Research Corporation, Palo Alto, Calif.

Filed Mar. 17, 1977, Ser. No. 778,615
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—445 T **65 Claims**



1. Apparatus for producing x-rays of sufficient intensity for full body tomography and directing such x-rays toward an object of interest from any of a plurality of preselected coplanar points spaced from that object and spaced radially about a line extending through that object, said apparatus having no moving parts and comprising

means for producing an electron beam;

stationary target means substantially surrounding a portion of said line and encompassing said coplanar points for receiving said electron beam and producing x-rays from said target points and directing said x-rays toward said object of interest;

an evacuated housing containing said beam producing means adjacent one end and said target means adjacent the opposite end;

means for directing said electron beam selectively to preselected said points on said target means; and

beam shaping means for correcting beam aberrations introduced by said beam directing means and for shaping said beam to a predetermined cross-sectional configuration adjacent its point of incidence upon said target, said configuration having a predetermined orientation relative to a line extending radially outwardly from said line through said object to said target point of incidence, and for maintaining said beam configuration and orientation for each said target point of incidence such that the projected beam of x-rays upon said object remains substantially constant from each said target point of incidence, whereby x-rays may be directed toward the object of interest from the target with the combination of the beam directing means and beam shaping means compensating for the effect of space charge forces acting on the beam and correcting for field aberrations imposed thereupon.

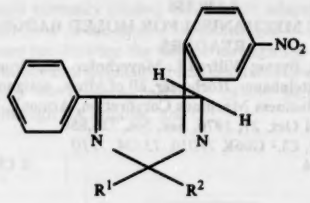
4,130,760

REUSABLE RADIATION MONITOR

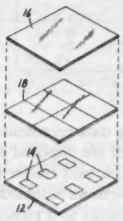
Dan L. Fanselow, White Bear Lake, and Dean A. Ersfeld, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 29, 1977, Ser. No. 811,253
Int. Cl.[2] G01N *5/00*
U.S. Cl. 250—474 **11 Claims**

1. A integrating, reusable device for monitoring actinic radiation of a preselected character comprising: a substrate having deposited thereon at least one photochromic aziridine compound of the formula



wherein R^1 and R^2 taken separately are hydrogen, alkyl having one to six carbon atoms inclusive, phenyl or ortho or para



lower alkyl or lower alkoxy substituted phenyl, or R^1 and R^2 taken together are alkylene having 4 to 7 carbon atoms inclusive;

an oxygen barrier associated with said aziridine compound to substantially prevent contact of said aziridine compound with oxygen;

filter means disposed between said aziridine compound and the source of actinic radiation to filter out actinic radiation other than that of the preselected character; and

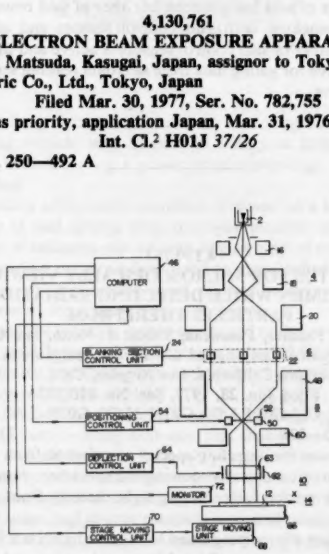
at least one color standard with which to compare the color change of said aziridine compound caused by exposure to the actinic radiation.

4,130,761

ELECTRON BEAM EXPOSURE APPARATUS

Takashi Matsuda, Kasugai, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1977, Ser. No. 782,755
Claims priority, application Japan, Mar. 31, 1976, 51-35657
Int. Cl.[2] H01J *37/26*
U.S. Cl. 250—492 A **16 Claims**



1. An electron beam exposure apparatus comprising:

an electron gun for emitting electron beams;

condenser means for parallelling the electron beams emitted from said electron gun;

blanking means for dividing the parallel electron beams passed through said condenser means into a plurality of discrete electron beam bundles and for selectively intercepting any individual ones of said plurality of discrete electron beam bundles;

deflection means for deflecting in a predetermined direction all the discrete bundles of parallel electron beams passed through said blanking means; and

stage means for holding a wafer scanned by the discrete bundles of electron beams deflected by said deflection means and for moving the wafer by a predetermined distance.

4,130,762

ARRANGEMENT FOR THE AUTOMATIC HEATING AND ADJUSTMENT OF A TREATMENT TEMPERATURE FOR THE TREATMENT OF WORKPIECES BY MEANS OF GLOW DISCHARGE

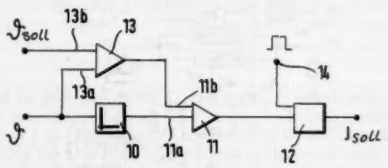
Werner Oppel, Cologne, Fed. Rep. of Germany, assignor to Kloeckner Ionon GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 16, 1977, Ser. No. 769,162

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606396

Int. Cl.² B01K *1/00*

U.S. Cl. 250—531 **7 Claims**



1. Apparatus for the automatic heating and adjustment of a predetermined treatment temperature of workpieces by means of current intensive glow discharge in a container, comprising: temperature measuring means in said container to deliver a value corresponding to the actual treatment temperature; means for supplying a comparison value corresponding to a desired treatment temperature; a differentiator having its input connected to said temperature measuring means to produce at its output a value corresponding to the time derivative of the actual treatment temperature; a comparator having one input connected to the output of said differentiator and the other input connected to said means for supplying the comparison value to produce at its output a control value corresponding to the difference between said time derivative of the actual temperature and the desired temperature; and a current regulator having its input connected to the output of said comparator to readjust the current in said container in response to said control value at the output of said comparator.

4,130,763

MACHINE GUARD INSTALLATIONS

David Mainprize, Tamworth, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England

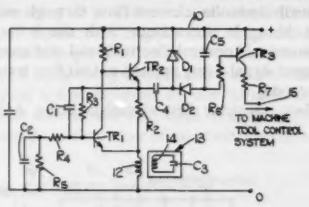
Filed Sep. 30, 1976, Ser. No. 727,996

Claims priority, application United Kingdom, Oct. 4, 1975, 40712/75

Int. Cl.² H01H *35/00*

U.S. Cl. 307—116 **13 Claims**

1. A machine guard installation including a guard movable out of an operative guarding position, a passive tuned circuit mounted on the guard, said tuned circuit includina a coil, and an active detector circuit comprising an amplifier including a pick-up coil which is magnetically coupled to the tuned circuit when the guard is in its operative position, said amplifier having an AC feedback path which includes the pick-up coil so that the increase in the apparent series resistance of the pick-up



coil, occuring when the guard moves into its operative position, causes oscillation of the detector circuit.

4,130,764

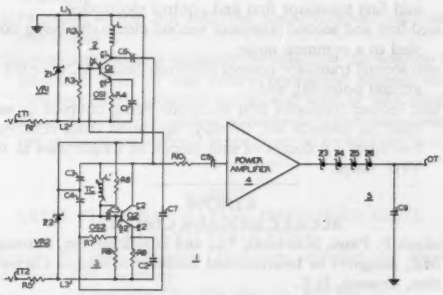
FAIL-SAFE OR LOGIC CIRCUIT

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jul. 27, 1977, Ser. No. 819,660

Int. Cl.² H03K *19/02, 19/30*

U.S. Cl. 307—218 **11 Claims**



1. A vital logic circuit comprising at least a first and a second fail-safe level detector, each of said first and said second fail-safe level detecting means including a voltage breakdown device and an oscillating circuit, a frequency determining circuit connected in common with each of said oscillating circuits, an amplifying means coupled to each of said oscillating circuits, and an output means connected to said amplifying circuit and producing an output signal either when a d.c. input signal exceeds the breakdown voltage of one of said breakdown devices of said first and second fail-safe level detecting means or when d.c. input signals exceed the breakdown voltages of both of said breakdown devices of said first and said second fail-safe level detecting means.

4,130,765

LOW SUPPLY VOLTAGE FREQUENCY MULTIPLIER WITH COMMON BASE TRANSISTOR AMPLIFIER

Rafi Arakelian, Khayam Ave., Lashgari St., Noubahar Junction #62, Shiraz, Iran, and Michael M. Driscoll, 4823 W. Parkway, Baltimore, Md. 21229

Filed May 31, 1977, Ser. No. 801,994

Int. Cl.² H03B *19/10*

U.S. Cl. 307—220 R **24 Claims**

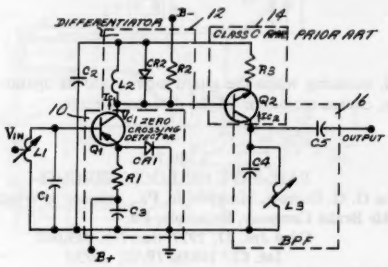
1. In a circuit for generating an output signal having a frequency equal to a multiple of the frequency of an input signal applied thereto, said circuit being of the type including a zero-crossing detector for providing a signal having frequency components at harmonics of said input signal frequency, and a filter for passing only predetermined ones of said harmonics, the improvement wherein:

said zero-crossing detector comprises:

first and second transistors, each having first and second electrodes defining a conduction path therebetween, and a control electrode, current flow through said conduction path being in accordance with the voltage difference between said control electrode and said second electrode;

said input signal being applied to said first transistor control electrode;

said first transistor first electrode being AC bypassed to



ground potential to prevent thereby feedback between said first transistor first and control electrodes;

said first and second transistor second electrodes being coupled to a common node;

said second transistor control electrode being AC coupled to ground potential; and

said second transistor first electrode being coupled to said filter, to provide for, thereby, operation from relatively low supply voltages of said circuit at frequencies in the VHF range.

4,130,766

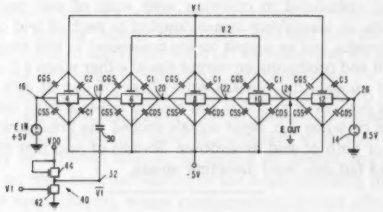
BUCKET BRIGADE CIRCUIT

Mukesh P. Patel, Manasssas, Va., and Huo-Bing Yin, Potomac, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 632,747, Nov. 17, 1975, abandoned. This application Oct. 13, 1977, Ser. No. 842,004

Int. Cl.[2] **G11C** *19/28, 19/18;* **H03K** *17/10, 17/16*

U.S. Cl. 307—221 D **7 Claims**



1. An improved bucket brigade shift register device, comprising:

a first bucket brigade switching device having an input electrode, an output electrode, and a control electrode, whose control electrode is connected to a first phase clock waveform and having a characteristic control electrode-to-output electrode capacitance at a first node, for propagating a charge signal from said input electrode to said first node when said first phase clock waveform is on;

a second bucket brigade switching device having an input electrode connected to said first node, an output electrode, and a control electrode, whose control electrode is connected to a second phase clock waveform which is non-overlapping with said first phase clock waveform, said first and second switching devices forming a bucket brigade shift register, for propagating said charge signal from said first node to said output electrode of said second switching device when said second phase clock waveform is on;

a capacitor of substantially equal magnitude to said characteristic control electrode-to-output electrode capacitance of said first bucket brigade switching device, connected between said first node and the inverse of said first phase clock waveform for supplying a compensating charge to said first node in response to said inverse of said first phase clock waveform to compensate for charge withdrawn through said control electrode-to-output electrode capacitance by said first phase clock waveform during its fall time;

whereby said charge signal can be propagated through said first and second bucket brigade switching devices without diminishing its amplitude, thereby enhancing the charge transfer efficiency and dynamic range of the bucket brigade shift register.

4,130,767

SEMICONDUCTOR SWITCH

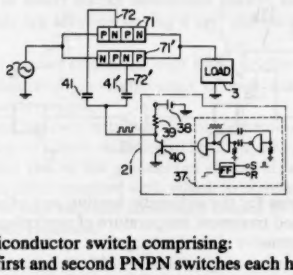
Shinzi Okuhara, Fujisawa, and Ichiro Ohhinata, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 14, 1976, Ser. No. 695,758

Claims priority, application Japan, Jun. 18, 1975, 50-73187

Int. Cl.[2] **H03K** *17/72*

U.S. Cl. 307—252 T **13 Claims**



1. A semiconductor switch comprising:

a pair of first and second PNPN switches each having a gate terminal and being connected in inverse-parallel relationship with each other between an AC power supply and a load, so that said PNPN switches are adapted for use where their cathode potentials float from ground potential to positive and negative potentials;

a first and a second capacitive element, each of which is capable of blocking D.C. current flow in both directions therethrough; and

a control circuit having an output terminal for generating a voltage pulse in a repetitive manner, the gate terminal of said first PNPN switch being connected to said output terminal through said first capacitive element, and the gate terminal of said second PNPN switch being connected to said output terminal through said second capacitive element, to thereby drive said PNPN switches.

4,130,768

LOW POWER TRUE/COMPLEMENT DRIVER

John Bula, Rockville, Md., and Ashok C. Patrawala, Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

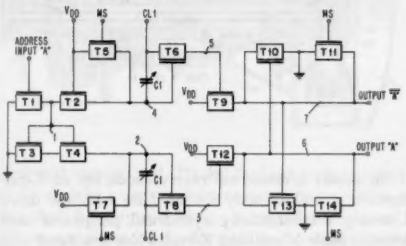
Filed Aug. 31, 1977, Ser. No. 829,416

Int. Cl.[2] **H03K** *17/60;* **G11C** *8/00;* **H03K** *19/40, 17/16*

U.S. Cl. 307—270 **3 Claims**

1. In a low power ratioless, true/complement generator circuit having an input FET with its gate connected to the input node, and its source connected to ground, and its drain connected to a phase-splitting node, a complement circuit branch and a true circuit branch connected to said phase-splitting node, said complement circuit branch including a first isolation FET, a first charging FET and a first bootstrapped

driver FET, said first isolation FET having its source connected to said phase-splitting node and its drain connected to the source of said first charging FET and to the gate of said bootstrapped FET, said first charging FET having its drain connected to a drain potential, and its gate connected to a memory select pulse, said first bootstrapped driver FET having its drain connected to a clock pulse which is non-overlapping with said memory select pulse and its source connected to a complementary output node, for generating the complement form of the signal at the input node when said clock pulse is present, said true circuit branch including an inverting FET, a second isolation FET, a second charging FET and a second bootstrapped driver FET, said inverting FET having its source connected to ground and its gate connected to said phase-splitting node, said second isolation FET having its source connected to the drain of said inverting FET and its drain connected to the source of said second charging FET and to the gate of said second bootstrapped FET, said second charging FET having its drain connected to said drain potential and its gate connected to said memory select pulse, said second bootstrapped driver FET having its drain connected to said clock pulse and its source connected to an output node, for generating the true form of the signal at the input node when said clock pulse is present, the improvement in which comprises:



said second isolation FET having a gate size substantially smaller than the gate size for said inverting FET;

said first isolation FET having its gate connected to said drain potential for isolating said gate of said first bootstrapped FET from said phase-splitting node when the potential of the gate of said first bootstrapped FET approaches its maximum value as it is charged by said charging FET;

said second isolation FET having its gate connected to said phase-splitting node for more rapidly switching from its on-state to its off-state than does said inverting FET;

whereby the number of clock pulse sources necessary to operate the generator circuit is reduced and the speed of the generator circuit is increased.

4,130,769

BRUSHLESS DC MOTOR

Yukuo Karube, Yokohama, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 31, 1975, Ser. No. 627,844

Claims priority, application Japan, Nov. 1, 1974, 49-126332; Nov. 13, 1974, 49-130632

Int. Cl.[2] H02K *37/00*

U.S. Cl. 310—46 **15 Claims**

1. A brushless DC motor comprising:

(a) a rotor including:

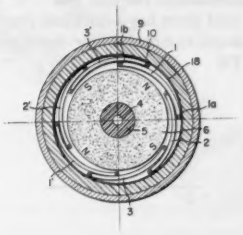
a rotor shaft and

a rotor permanent magnet fixed on said rotor shaft;

(b) a stator including:

a hollow cylindrical yoke made of soft magnetic material as a magnetic flux return path of the magnetic flux from said rotary magnet and

an armature coil body formed in the shape of a hollow cylinder, wherein said armature coil body is disposed in an annular space between said rotary magnet and said yoke and is fixed on the internal surface of said yoke, said coil body comprising a plurality of coil elements each of which is of planar multiangular ring shape having two sides substantially parallel to the axis of said rotor shaft, and said coil body being constructed such that all of said coil elements are superposed on one another in such a relation that one of said two sides of each coil element appears outside, and another of said two sides of each coil



element appears inside, so that a ring shape of coil body is formed, and said coil elements being fixed in a cylindrical structure;

(c) a casing having end walls and supporting said rotor and stator; and

(d) position detecting elements for detecting the position of magnetic poles of said rotary permanent magnet, said elements being mounted on an end wall of said casing adjacent to the end surface of said rotary permanent magnet at the place where it is not covered by said coil body.

4,130,770

AXIAL FLOW FAN HAVING IMPROVED AXIAL LENGTH STRUCTURE

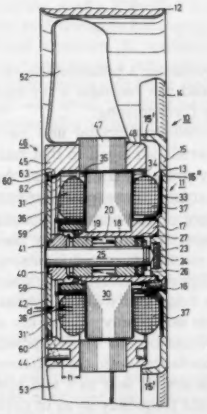
Güenter Wrobel, Villingen, Germany, assignor to Papst-Motoren KG, Germany

Filed May 20, 1974, Ser. No. 471,604

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1974, 7406629[U]

Int. Cl.[2] H02K *7/00*

U.S. Cl. 310—67 R **28 Claims**



1. In an axial-flow fan motor structure of the type comprising an external rotor including a rotor stack and at least two short-circuit rings, said rotor being mounted for rotation about an axis, a stator structure mounted about said axis, and a rotor

shaft and fitting mounted on said axis, said fitting being a sheet having anchoring elements extending about a peripheral edge of said fitting for connecting said rotor to said rotor shaft by connection of said anchoring elements to one of said two short-circuit rings, the improvement comprising said anchoring elements being disposed at an angle α of less than 45° with respect to the plane of said sheet such that the resistance of said one short-circuit ring is reduced.

wherein said anchoring elements extend at an angle α of about 20° to 35° to the plane of said sheet,

wherein said fitting is a thin steel sheet having reinforcing embossed indentations thereon, and

wherein said steel sheet has a thickness corresponding to a ratio of thickness to motor air gap diameter in the range of about 2 to 3%.

4,130,771

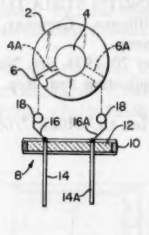
METHOD OF ADJUSTING THE FREQUENCY OF A CRYSTAL RESONATOR AND REDUCING AGEING EFFECTS

Virgil E. Bottom, Abilene, Tex., assignor to Tyco Crystal Products, Inc., Phoenix, Ariz.

Continuation of Ser. No. 658,523, Feb. 17, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,072

Int. Cl.² H01L *41/22*

U.S. Cl. 310—312 **11 Claims**



1. Method of producing a piezoelectric crystal unit that is resistant to aging and can maintain a predetermined nominal resonant frequency f_r comprising:

providing a piezoelectric crystal unit having at least one aluminum electrode arranged so that said unit has a resonant frequency greater than f_r and so that the aluminum electrode has at least one exposed surface;

making said at least one aluminum electrode of said unit the anode and a separate aluminum body the cathode, respectively, in an electric circuit comprising a D.C. power supply and a liquid electrolyte which surrounds said unit and aluminum body and which contains oxygen-bearing anions and does not dissolve aluminum oxide; and

adjusting the voltage output by said power supply to said circuit in accordance with the difference between the resonant frequency of said unit and said predetermined nominal resonant frequency so as to cause an oxide layer to be formed on said at least one electrode by anodic oxidation to a thickness of at least about 50A to cause said resonant frequency to be stabilized and changed to substantially said nominal frequency and to make said unit resistant to aging.

4,130,772

LIQUID-COOLED ROTARY ANODE FOR AN X-RAY TUBE

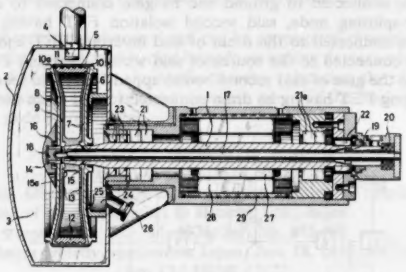
Eckhard Küssel, Düren; Heinz G. Haubold, Julich; Franz Joswig, Jülich, and Karl H. Klatt, Jülich, all of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Mar. 14, 1978, Ser. No. 886,391

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711848

Int. Cl.² H01J *35/10*

U.S. Cl. 313—32 **3 Claims**



1. An axially symmetrical rotary anode for an X-ray tube, comprising a hollow body mounted on a hollow drive shaft and having a substantially cylindrical peripheral wall of a material capable of emitting X-rays when irradiated with electrons and containing ducts for leading a liquid cooling medium into and away from cooling relation with said peripheral wall and from and to respective ducts in said shaft, and comprising the improvement consisting in that:

a plurality of radial cooling medium supply ducts (**7**) are connected together by a first ring duct (**10**) and both said radial supply ducts and said first ring duct are located on the inner surface of a first axial-end wall of said hollow body;

a plurality of radial cooling medium discharge ducts (**9**) are connected together by a second ring duct (**10*a***) and both said radial discharge ducts and said second ring duct are located on the inner surface of a second and axially opposite end wall of said hollow body;

a plurality of cooling ducts (**11**) run parallel to each other, obliquely along the inside of said peripheral wall (**5**), from said first ring duct (**10**) to said second ring duct (**10*a***), evenly distributed over said peripheral wall (**5**), and each such cooling duct (**11**) has a length not less than **150**mm nor greater than **250**mm, and

said cooling ducts (**11**) are formed on the outside by the material of said peripheral wall (**5**) and on the inside by a material of high mechanical strength extending between the cooling ducts and firmly connected to the material of said peripheral wall (**5**).

4,130,773

X-RAY TUBE WITH LIQUID-COOLED ROTARY ANODE

Eckhard Küssel, Düren, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Mar. 14, 1978, Ser. No. 886,416

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711847

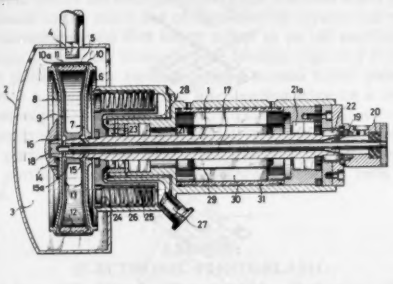
Int. Cl.² H01J *35/10*

U.S. Cl. 313—32 **6 Claims**

1. An X-ray tube having a rotary liquid-cooled anode mounted on a hollow drive shaft and served with cooling medium through radial supply and discharge ducts in the anode and coaxial supply and discharge ducts in said shaft, said shaft being mounted on two bearings and being provided with

a radially disposed vacuum seal between the anode and the one of the shaft bearings that is nearer to the anode, the tube further comprising the improvement that consists in that:

the radial cooling medium supply ducts (7) are connected together by a first set of cross ducts (10), the radial cooling medium discharge ducts (9) are connected together by a second set of cross ducts (10*a*), and the cross ducts of the first set are connected to those of the second set by duct sections (11) directly and firmly adjoining the portion (5) of the rotary anode made of X-ray generating electron-target material, immediately inward of said anode portion, and



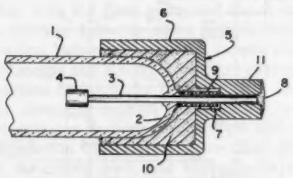
between said vacuum seal (22) and the high vacuum space of the X-ray tube a turbomolecular pump coaxial with said drive shaft is interposed having rotor (24) and stator (26) vane arrays, alternatingly disposed in the axial direction, the rotor vane arrays being part of a rotor driven in common with said drive shaft, the stator vane arrays being fixed on the tube casing, the suction side of said pump facing said high vacuum space (3), and a discharge connection (27) being provided for said pump through the tube envelope for the discharge side of the pump for connection to a gas removal suction line.

4,130,774

FLASH TUBE HAVING IMPROVED END CAP CONSTRUCTION

Robert J. Cosco, Amesbury; Charles C. Kokinos, Jr., and Charles J. Geleski, both of Lynn, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 14, 1977, Ser. No. 851,158
Int. Cl.[2] H01J *5/46*
U.S. Cl. 313—318 **2 Claims**



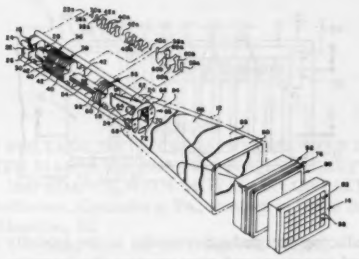
1. A flash tube comprising: an elongated glass envelope sealed at its end; an end cap having a shoulder portion and a terminal portion, the shoulder portion encircling the end of the envelope and being bonded thereto with bonding material; a lead-in wire extending through the end of the envelope and being connected to the terminal portion of the end cap; and a cushioning sleeve disposed on the lead-in wire and preventing contact of the bonding material with the lead-in wire.

4,130,775

CHARGE IMAGE CHARGE TRANSFER CATHODE RAY TUBE HAVING A SCAN EXPANSION ELECTRON LENS SYSTEM AND COLLIMATION ELECTRODE MEANS

Peter E. Perkins, Tigard, and Stephen F. Blazo, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 17, 1977, Ser. No. 760,053
Int. Cl.[2] H01J *31/58, 29/56*
U.S. Cl. 313—397 **14 Claims**



8. A charge image transfer cathode ray tube, comprising:

transmission storage target means including mesh electrode means having mesh openings therethrough and storage dielectric means provided on said mesh electrode means without covering said mesh openings;

flood gun means for generating toward said transmission storage target means flood electron beams of low velocity electrons;

electron gun means including cathode means for generating an electron beam of high velocity electrons, focusing means defining quadrupole lens means for focusing said electron beam into a writing beam and deflection means including elements for deflecting said writing beam along said storage dielectric means in mutually perpendicular directions thereby forming a positive charge image thereon, said quadrupole lens means including first quadrupole lens means positioned between said electron gun means and said deflection means for focusing said electron beam in mutually perpendicular directions and second quadrupole lens means positioned between said elements of said deflection means for amplifying the electron beam deflection while maintaining the electron beam velocity constant; and

collimating electrode means provided between said flood gun means and said transmission storage target means to cause said flood electrons to uniformly bombard said storage dielectric means at a substantially normal direction thereto and to enable said flood electrons to be transmitted through said mesh openings adjacent said charge image at a substantially normal direction thereto.

4,130,776

EL BAR GRAPH FOR DISPLAYING ANALOGUE MEASUREMENTS OF TEMPERATURE AND THE LIKE

Thomas L. Robinson, Sr., East Aurora, N.Y., assignor to T. L. Robinson Co., Inc., East Aurora, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,471
Int. Cl.[2] H05B *33/02*
U.S. Cl. 313—507 **10 Claims**

1. An electroluminescent device, comprising

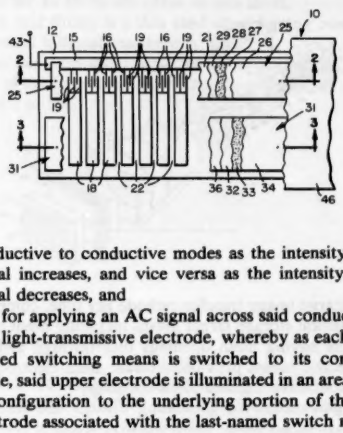
a substrate,

a first EL lamp on said substrate having a plurality of spaced, lower electrodes overlying one surface of said substrate, an upper, light-transmissive electrode overlying one end each of said lower electrodes, and a layer of EL material interposed between said upper electrode and the portions of the lower electrodes positioned therebeneath,

a conductor mounted on said substrate in spaced, confronting relation to the opposite ends of said lower electrodes,

a plurality of spaced, light-responsive switching means for selectively connecting said conductor to said opposite ends of said lower electrodes,

means shielding said spaced switching means from ambient light normally to maintain said switching means substantially in electrically non-conductive modes, and responsive to an electrical signal of variable intensity successively to switch said spaced switching means from non-



conductive to conductive modes as the intensity of said signal increases, and vice versa as the intensity of said signal decreases, and

means for applying an AC signal across said conductor and said light-transmissive electrode, whereby as each of said spaced switching means is switched to its conductive mode, said upper electrode is illuminated in an area similar in configuration to the underlying portion of the lower electrode associated with the last-named switch means.

4,130,777

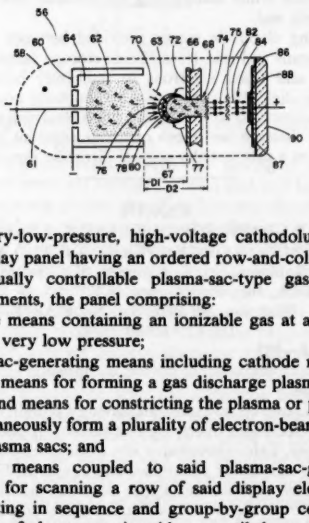
SCANNING MEANS AND METHOD FOR A PLASMA-SAC-TYPE GAS-DISCHARGE IMAGE DISPLAY PANEL

Michael C. De Jule, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 769,127, Feb. 16, 1977. This application Aug. 29, 1977, Ser. No. 828,792

Int. Cl.[2] H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169 TV **21 Claims**



1. A very-low-pressure, high-voltage cathodoluminescent image display panel having an ordered row-and-column array of individually controllable plasma-sac-type gas-discharge display elements, the panel comprising:

envelope means containing an ionizable gas at a predetermined very low pressure;

plasma-sac-generating means including cathode means and anode means for forming a gas discharge plasma or plasmas, and means for constricting the plasma or plasmas to simultaneously form a plurality of electron-beam-generating plasma sacs; and

scanning means coupled to said plasma-sac-generating means for scanning a row of said display elements by activating in sequence and group-by-group consecutive groups of plasma sacs in said row until the entire row of display elements is scanned.

4,130,778

DC PDP WITH DIVIDED CATHODE

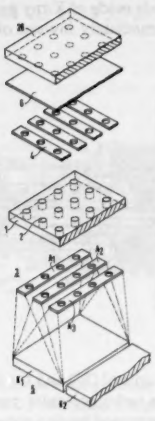
David W. Branston, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 22, 1977, Ser. No. 835,782

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643915

Int. Cl.[2] H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169 TV **7 Claims**



1. In a pictorial display device with a matrix of gas discharge cells which include an anode and a cathode and having associated auxiliary anodes for controlling the rows and control electrodes for the brightness control of the columns with an auxiliary gas discharge path between the cathode and the auxiliary anodes and an electron acceleration path between the control electrodes and the anode, the improvement comprising the cathode being made up of a plurality of subcathodes and each of said subcathodes being associated with a group of auxiliary anodes.

4,130,779

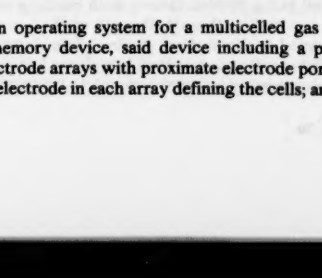
SLOW RISE TIME WRITE PULSE FOR GAS DISCHARGE DEVICE

John W. V. Miller, Toledo, and Ray L. Trogdon, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 27, 1977, Ser. No. 791,295

Int. Cl.[2] H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169 TV **14 Claims**



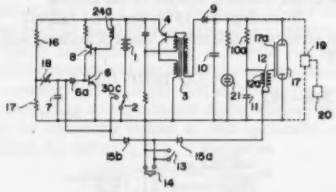
1. In an operating system for a multicelled gas discharge display/memory device, said device including a pair of opposed electrode arrays with proximate electrode portions of at least one electrode in each array defining the cells; an ionizable

gas volume between the spaced electrode portions of each cell; a dielectric charge storage member in contact with the gas insulating at least one electrode portion of each cell from the gas; a sustainer voltage source connected across each cell to cyclically impose an alternating voltage having a period; pulser means for generating write and erase voltage pulses to manipulate the discharge state of individual cells between an "on state" and an "off state"; and keyer pulser means for generating a steeply rising leading edge on the write and erase voltage pulses, the improvement comprising: said dielectric charge storage member formed from a low operating voltage material; said keyer pulser means including a first keyer pulser connected to one of the electrode arrays and a second keyer pulser connected to the other one of the electrode arrays; and means for maintaining said first keyer pulser in an off condition to generate a relatively slow rise time leading edge on a first half select pulse and for turning on said second keyer pulser to generate a relatively fast rise time leading edge on a second half select pulse, said first and second half select pulses forming said write voltage pulses with a relatively fast rise time leading edge portion followed by a relatively slow rise time leading edge portion whereby crosstalk between adjacent cells is reduced.

4,130,780
ELECTRONIC PHOTOFLASH

Itsuki Ban, 829, Higashi-Oizumi-machin, Nerima-ku, Tokyo; Kyoichi Inoue, 2-13, Hagiyama-machi, Higashi-murayama-shi, Tokyo, and Takatoshi Kogure, 3-30-24, Soshigaya, Setagaya-ku, Tokyo, all of Japan

Filed Nov. 1, 1977, Ser. No. 847,431
Claims priority, application Japan, Nov. 9, 1976, 51-133782
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—241 P **16 Claims**



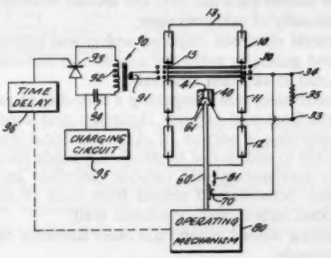
1. In an electronic photoflash having a light flash generator means for producing light flashes by discharges of high voltage energy stored in a storage capacitor adapted to be charged with current derived from an oscillator adapted to operate when connected to a battery power supply and wherein the flashing of said electronic photoflash is controlled by the closure of an external switch; the improvement comprising:

a switch means for switching the power supply in and out of connection with the flash generator means including an actuator movable between a first position corresponding to connection between the power supply and the flash generator means and a second position corresponding to no connection between the power supply and the flash generator means; a magnet means operably associated with said actuator and adapted to hold said actuator in said first position by mangetic attraction; spring means operably associated with said actuator for urging said actuator to said second position; a knob connected to said actuator and adapted to be manually manipulated for movement of said actuator to said first position or to said second position; a coil operably associated with said actuator and said magnet means and adapted to produce a magnetic field when supplied with current; a control circuit for supply current to said coil, said control circuit including a delay circuit for providing a predetermined time interval from the time at which the actuator is placed in the first position until when said control circuit provides current to said coil; said magnetic field produced by said coil when supplied with current from said control circuit being sufficient to overcome the magnetic attraction of said magnet means so that said actuator is no longer held in said first position and is returned to said second position by said spring means; and said delay circuit including means for resetting said delay circuit each time the electronic photoflash is flashed.

4,130,781
HIGH VOLTAGE D-C VACUUM INTERRUPTER DEVICE WITH MAGNETIC CONTROL OF INTERRUPTER IMPEDANCE WITH MOVABLE CONTACT

Rolf Dethlefsen, Greensburg, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 14, 1977, Ser. No. 777,453
Int. Cl.[2] H01J *1/50*; H01H *9/44*
U.S. Cl. 315—331 **9 Claims**



1. A circuit interrupter comprising, in combination:

an evacuated housing having an axis;

a ring-shaped anode electrode disposed coaxially with said housing, and a terminal connected to said ring-shaped electrode and accessible externally of said housing;

a cathode electrode disposed within said housing and spaced from and insulated from said anode electrode and being coaxial with said anode electrode, and a terminal connected to said cathode electrode and accessible externally of said housing;

an electrical winding concentrically surrounding said anode electrode for producing a magnetic field in the space between said cathode and anode electrodes to increase the impedance of an arc in said space and to extinguish said arc;

a movable contact disposed within said housing and being relatively movable into and out of engagement with said cathode electrode and operable from regions external of said housing;

and circuit means for connecting said movable contact to said anode electrode when said movable contact engages said cathode electrode, thereby to define a closed circuit between said first and second terminals when said movable contact engages said cathode electrode; said movable contact and cathode electrode being arranged whereby an arc is drawn between said movable contact and said cathode electrode when said movable contact is moved away from said cathode electrode, which arc is rapidly transferred to between said anode and cathode electrodes;

and power supply circuit means for applying current to said electrical winding after said movable contact separates from said cathode electrode.

4,130,782

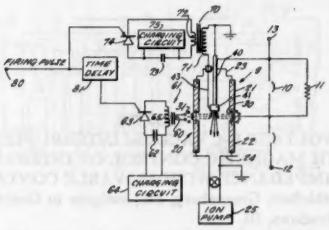
HIGH VOLTAGE D-C VACUUM INTERRUPTER DEVICE WITH MAGNETIC CONTROL OF INTERRUPTER IMPEDANCE

Rolf Dethlefsen, Greensburg, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 14, 1977, Ser. No. 777,479

Int. Cl.[2] H01J *1/50*; H01H *33/18*

U.S. Cl. 315—335 **9 Claims**



1. A current-limiting device comprising, in combination:

an evacuated container having a cylindrical wall having first and second ends and first and second terminals accessible externally of said container;

a cathode electrode disposed within said container and located generally along the axis of said container and connected to said first terminal;

an anode electrode comprising a ring-shaped member insulated from said cathode electrode; said anode electrode comprising a portion of said cylindrical wall and connected to said second terminal; said anode electrode coaxially surrounding said cathode electrode and being disposed between and spaced from each of said first and second ends of said cylindrical wall;

a winding wound around the outer diameter of said anode electrode;

said current-limiting device being operable to carry current through an arc drawn between said cathode electrode and said anode electrode; said winding being operable to produce a magnetic field which extends through said arc in order to increase the electrical impedance of said arc, and to extinguish said arc;

triggering circuit means connected to said cathode electrode for producing an initial arc plasma which is subsequently transferred to said anode electrode;

and a time delay circuit connecting said triggering circuit means to said winding, whereby a magnetic field pulse is appied to the interelectrode space between said cathode and anode electrodes with a given time delay.

4,130,783

SIDE PINCUSHION CORRECTION CIRCUIT WITH LOW DISSIPATION DAMPING

Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,784

Claims priority, application United Kingdom, Sep. 6, 1976, 36864/76

Int. Cl.[2] H01J *29/56*

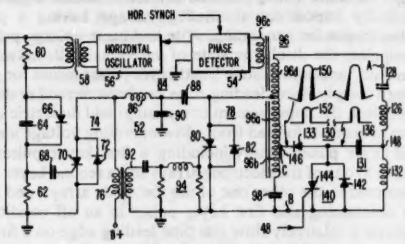
U.S. Cl. 315—371 **9 Claims**

1. A switched East-West raster correction circuit for a television deflection apparatus including a generator of periodic horizontal-rate deflection current, comprising:

a horizontal deflection winding coupled to the horizontal deflection current generator for accepting horizontal deflection current therefrom;

an impedance circuit coupled in circuit with said deflection winding and defining in conjunction with said winding a path for said horizontal deflection current;

controllable switch means coupled in circuit with said impedance circuit and operated at a time during each horizontal period which is progressively altered in a manner to reduce raster distortion; and



damping means including a voltage source and second switch means for coupling said voltage source with said impedance circuit during at least a portion of said horizontal period for reducing oscillations.

4,130,784

APPARATUS FOR COMPENSATING ORDINATE PHASE LAG IN A PLOTTING APPARATUS

Michael A. Ford, Buckinghamshire, Great Britain, assignor to Perkin-Elmer Limited, Bucks, Great Britain

Filed Sep. 10, 1976, Ser. No. 722,192

Claims priority, application United Kingdom, Sep. 12, 1975, 37509/75

Int. Cl.[2] H02P *1/58*

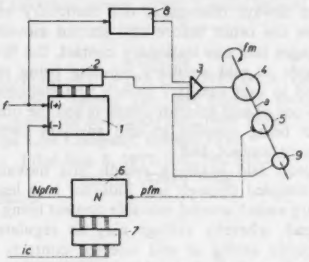
U.S. Cl. 318—102 **12 Claims**

1. In an apparatus for plotting a dependent variable quantity against an independent variable quantity comprising separate means for generating the two variables, the means for generating the dependent variable including a modifying system at least one parameter of which introduces in operation a significant variable time delay between the occurrence of an instantaneous value of the dependent variable and the plotting thereof against the independent variable leading to a variable dependent phase-lag in the plotting of the two variables as the means for generating the independent variable scans through successive values thereof, THE COMBINATION with one of the two means for generating the variables of phase tracking means for producing an output quantity representing any such phase-lag and dependent phase-lag compensating means in operational relationship with the phase tracking means to introduce a phase shift in response to said output in said one of two means, whereby in operation, the effect of dependent phase-lag on plotting fidelity is substantially cancelled.

4,130,785
CONTROL ASSEMBLY FOR A CYCLICALLY OPERATING POWERED UNIT

Pierre M. M. Penet, 4 Rue de Bourgogne, Creteil, France (94)

Filed Jan. 24, 1977, Ser. No. 762,179
Claims priority, application France, Jan. 26, 1976, 76 01996
Int. Cl.[2] H02P 5/00
U.S. Cl. 318—318 6 Claims

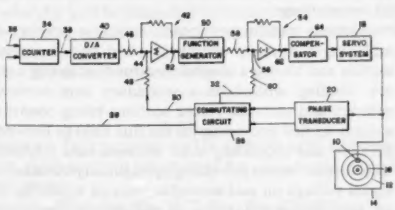


1. A control assembly for a cyclically operating electrically or hydraulically powered unit, which includes a control loop arrangement at least part of which is adapted to handle digital signals, said loop arrangement comprising a reversible counter including a plurality of successive stages and having a count-up series input, a count-down series input and parallel outputs at its successive stages; a sensor associated with said cyclically operating unit for the production of pulses at a multiple of the operating frequency thereof and including sensor output means for deriving a signal from the sensor and applying it to one input of said counter; means for applying a control frequency signal to the other of the inputs of the counter whereby the counter output provides a digital indication of any difference between the control frequency and the sensor output signal; a digital-to-analog converter having a number of successive inputs parallel connected to the respective stage outputs of the reversible counter and a single output providing an analog signal corresponding to the counter digital output; and means connecting the converter output to said cyclically operating unit to control the same.

4,130,786
APPARATUS FOR GENERATING LINEAR AND CONTINUOUS POSITIONAL ERROR AND VELOCITY SIGNALS FOR HIGHER ORDER SERVO SYSTEMS

James O. Jacques, Tracy, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 17, 1976, Ser. No. 742,727
Int. Cl.[2] G05B 13/00
U.S. Cl. 318—561 24 Claims



1. Apparatus for generating a first continuous, linear waveform from first and second triangular waveforms, the second triangular waveform being phase shifted in relation to the first triangular waveform, comprising:

(a) means, responsive to said first and second triangular waveforms, for generating a sawtooth waveform, each tooth of said sawtooth waveform being of equal amplitude and the amplitude of each transition from one tooth to another tooth being equal;

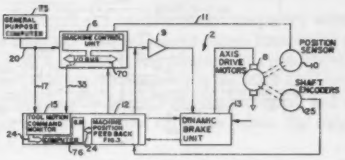
(b) means for generating a staircase waveform, each step of said staircase waveform being equal in amplitude to the transition from one said tooth to another said tooth, and the commencement of each said step being coincident with a said transition; and

(c) means for summing said sawtooth waveform and said staircase waveform.

4,130,787
RELIABILITY MONITORING SYSTEM

William P. Allaire, St. Peters, Mo.; William J. Mayer, Belleville, Ill., and Thomas A. Zambetis, Hazelwood, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Mar. 10, 1977, Ser. No. 776,307
Int. Cl.[2] G05B 23/02
U.S. Cl. 318—565 12 Claims



1. A system for monitoring operation of a computer controlled machine tool, said machine tool including a machine control unit having an input operatively connected to said computer and an output operatively connected to said machine tool along an input-output bus, data on the input-output bus of said machine control unit operating said machine tool, comprising:

means for receiving idealized path data for said machine tool from the input side of said machine control unit;

means for detecting changes of state in the transient data on the input-output bus of said machine control unit;

means dedicated to the monitoring system for determining the actual position of said machine tool independently of any other tool position monitoring means;

means for comparing the idealized path data for said machine tool with the actual position of the machine tool as determined by said dedicated means for determining actual machine tool position; and

means for indicating machine tool malfunction when the data collected by said monitoring system from one of the input-output bus of the machine control unit and the actual machine tool position determined by the dedicated means for determining actual tool position falls outside a predetermined value.

4,130,788
NUMERICAL CONTROL SERVO SYSTEM

Allan G. Fiegehen, Orange; Robert P. Houghton, Anaheim; Cecil Earl Bradley, Alta Loma, and Paul F. Richenburg, Orange, all of Calif., assignors to General Automation, Inc., Anaheim, Calif.

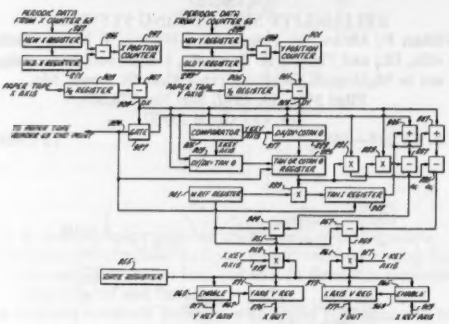
Filed Nov. 1, 1973, Ser. No. 412,023
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976
Int. Cl.[2] G05B 19/24, 19/40
U.S. Cl. 318—574 14 Claims

1. A digital computer circuit arranged to drive a pair of motors, said motors connected to relatively move a tool and a workpiece along two mutually perpendicular axes, said motors being responsive to velocity command digital signals generated by said circuit to relatively move said tool and workpiece

along a line the end points of which are defined by input digital data relative to said mutually perpendicular axes, comprising:

means for measuring the relative position of said tool and said workpiece and for periodically producing position digital signals defining the actual relative position of said tool and workpiece along each of said perpendicular axis;

means for adding a reference digital signal defining a predetermined length along one of said perpendicular axes to said position digital signal defining the actual relative position of said tool and workpiece along said one of said perpendicular axes to produce a target digital signal defining the location of a point along said line between said end points;



means responsive to said position digital signals, said target digital signal and said input digital data for generating a distance digital signal defining the distance between said point along said line between said end points and the actual relative position of said tool and workpiece along the other of said perpendicular axes; and

means for generating said velocity command signals in proportion to said reference digital signal for one of said pair of motors and in proportion to said distance digital signal for the other of said pair of motors.

4,130,789

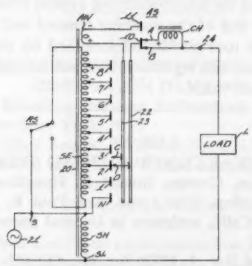
TAP CHANGING VOLTAGE REGULATOR WHICH ELIMINATES PREVENTIVE AUTOTRANSFORMER

Manfred E. Neumann, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jul. 25, 1977, Ser. No. 818,987

Int. Cl.[2] G05F 1/14

U.S. Cl. 323—43.5 R **9 Claims**



4. Tap changer voltage regulating apparatus comprising, in combination,

a magnetic core,

an exciting winding linking said magnetic core,

a tapped winding linking said magnetic core and having a plurality of taps,

a half-tap voltage auxiliary winding linking said magnetic core, the number of turns of said auxiliary winding being approximately one-half the number of turns between adjacent taps of said tapped winding,

first and second tap changer movable selector contacts adapted to sequentially engage said taps,

an auxiliary switch having first and second stationary contacts, first and second movable contacts normally engaging the same stationary contact, and means for stepping said movable contacts alternately between said first and second stationary contacts so that said first movable contact always disengages one stationary contact and engages the other before said second movable contact disengages said one stationary contact, the first and second ends of said auxiliary winding being respectively coupled to said auxiliary switch first stationary contact and to one of said selector contacts and the other selector contact being coupled to said auxiliary switch second stationary contact, and

an inductor, said auxiliary switch first movable contact being coupled through said inductor to a lead and said auxiliary switch second movable contact being coupled to said lead, whereby voltage may be regulated without appreciable arcing at said selector contacts or at said auxiliary switch first movable contact.

4,130,790

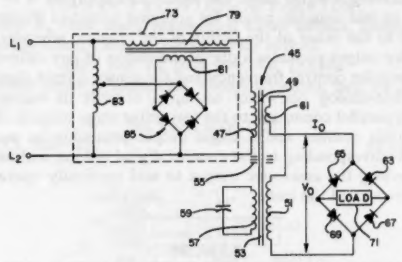
FERRORESONANT TRANSFORMER POWER SUPPLY

Larry E. Heisey, Troy, Ohio, assignor to Hobart Brothers Company, Troy, Ohio

Filed Apr. 25, 1977, Ser. No. 790,409

Int. Cl.[2] G05F 1/32

U.S. Cl. 323—60 **13 Claims**



1. A power supply for converting an alternating current electrical power signal to an output electrical power signal, said power supply maintaining the voltage of said output signal at a predetermined level when the current level of said output signal is less than a predetermined value and reducing the voltage of said output signal below said predetermined level when said output signal current level exceeds said predetermined value such that the current level of said output signal is limited, comprising:

ferroresonant transformer means, having a primary circuit including a primary winding wound on a primary core section and having a secondary circuit including a secondary winding wound on a secondary core section, said primary and secondary core sections being connected by a shunt section providing partial flux linkage between said primary and secondary core sections, said ferroresonant transformer means providing substantially constant output signal voltage on said secondary circuit when the voltage on said primary winding is sufficient to maintain said secondary core section in saturation,

input terminal means for connection to an alternating current power source; and

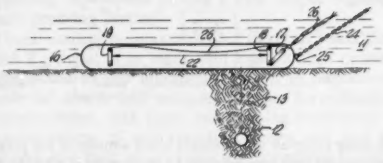
saturable reactor means, connected between said input terminal means and said primary circuit of said ferroresonant transformer means, for reducing the voltage supplied to said primary winding of said ferroresonant transformer means in dependence upon the current therethrough, said

saturable means including variable control current supply means for providing a control current to said saturable reactor means such that the impedance of said saturable reactor means may thereby be controlled and the voltage drop across said primary winding determined for each level of current flow through said primary circuit, whereby the current level in said secondary circuit which is sufficient to prevent said secondary core section from being held in saturation may be set and the current of said output electrical power signal thereby limited.

4,130,791
AUTOMATIC PIPE DEPTH LOCATOR

Carlton M. Slough, Spring, Tex., and Earl M. Romero, Broussard, La., assignors to Texaco Inc., New York, N.Y. and The Texas Pipe Line Company, Bellaire, Tex.

Filed Sep. 8, 1977, Ser. No. 831,570
Int. Cl.[2] G01V *3/08*
U.S. Cl. 324—3 **5 Claims**



1. Pipe depth locator for use in automatically determining the depth of a pipe beneath a predetermined datum level, said pipe having AC signals impressed thereon and said AC signals having a predetermined frequency, comprising in combination

an elongated housing adapted for being transported across said pipe location at said datum level,

at least three pick up coils located in said housing for detecting said AC signals emanating from said pipe,

said pick up coils having the axes thereof oriented for directional characteristics in order to determine when said signals are emanating from a predetermined direction relative thereto,

two of said pick up coils being spaced apart a predetermined distance equal to a preselected depth of said pipe from said datum level and being oriented with the axes thereof transverse to the plane of said datum level,

a third of said pick up coils being located at the same place as one of said two pick up coils and being oriented with the axis thereof at a predetermined angle relative to the plane of said datum level, and

electric circuit means connected to said pick up coils,

said circuit means comprising means for detecting null outputs from said pick up coils, and

timing means for relating said null outputs from said two detectors to said null output from said third detector,

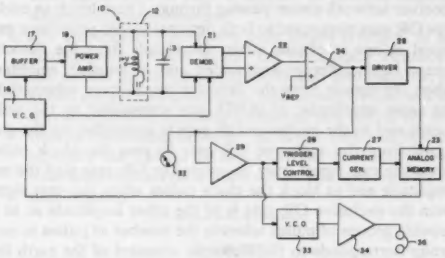
all whereby said housing may be transported across said pipe location at said datum level at a constant speed in order to indicate when said null outputs have occurred so that said pipe depth may be determined.

4,130,792
METAL DETECTOR WITH FEEDBACK TUNING

John W. Sullivan, 2040 Middlefield Rd., Apt. 9, Mountain View, Calif. 94040

Filed Sep. 30, 1977, Ser. No. 838,096
Int. Cl.[2] G01V *3/08*
U.S. Cl. 324—3 **3 Claims**

1. In a metal detector: a metal sensing transducer having a resonant frequency dependent upon proximity of the transducer to metal objects, controlled oscillator means for exciting the transducer with a signal of variable frequency to provide an output signal having a level corresponding to the frequency relationship between the excitation signal and the resonant frequency of the transducer, memory means comprising a capacitor connected to the oscillator means for storing a control signal which determines the frequency of the excitation signal, and means responsive to the output signal for adjusting the control signal to maintain the output signal at a predetermined level in the absence of metal objects and for maintaining

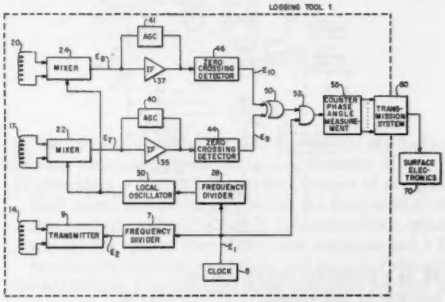


the control signal at a predetermined frequency when a metal object is detected, said last named means comprising means for charging the capacitor in one direction at a predetermined rate, means for charging the capacitor in the other direction at a rate corresponding to the level of the output signal, and means for inhibiting charging of the capacitor when the output signal reaches a threshold level.

4,130,793
DIELECTRIC WELL LOGGING MEANS AND METHOD UTILIZING THE SIGNALS FROM A PAIR OF RECEIVERS FOR PROVIDING CLOCK PULSES CORRESPONDING TO EARTH FORMATION DIELECTRIC CONSTANT

James R. Bridges; Roland G. Riedesel, Jr., and Larry W. Thompson, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,317
Int. Cl.[2] G01V *3/18, 3/10*; G01R *25/00*
U.S. Cl. 324—6 **10 Claims**



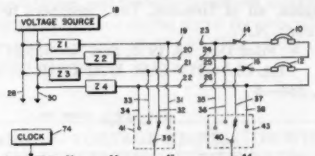
1. Well logging means adapted to be passed through a borehole traversing an earth formation and for providing a signal corresponding to the dielectric constant of the earth formation comprising pulse means for providing clock pulses at a predetermined frequency substantially greater than the intermediate frequencies; first dividing means connected to the pulse means for providing transmit pulses at a substantially lower frequency than the clock pulses; transmitter means connected to the first divider means for inducing electrical energy into the earth formation at a radio frequency in accordance with the transmit pulses; second dividing means connected to the pulse means for providing beat pulses at a substantially lower frequency than the clock pulse but slightly greater than the frequency of the transmit pulses; at least two receiver means spaced a predetermined distance from each other, each receiver means in-

cludes receiver network means connected to the second dividing means for providing a signal, at an intermediate frequency, corresponding to received electrical energy from the earth formation in accordance with the beat pulses, and detector means, each detector means being connected to a corresponding receiver network means for providing a signal whose change in amplitude is representative of the signal from the receiver network means passing through a zero level; an exclusive OR gate connected to both detector means provides a gate signal at one amplitude when the signals from the detector means have different amplitudes and at another amplitude when the signals from the detector means have substantially the same amplitude; an AND gate connected to the pulse means and to the exclusive OR gate is controlled by the gate signal from the exclusive OR gate to pass the clock pulses when the gate signal from the exclusive OR gate is of the one amplitude and to block the clock pulses when the gate signal from the exclusive OR gate is of the other amplitude so as to provide groups of pulses wherein the number of pulses in each group corresponds to the dielectric constant of the earth formation; counter means connected to the AND gate for counting the pulses in each group of pulses so that its count corresponds to the dielectric constant of the earth formation; and means connected to the counter means for providing the signal corresponding to the dielectric constant of the earth formation in accordance with the count in the counter means.

4,130,794
METHODS AND MEANS FOR IDENTIFYING AND TESTING CIRCUIT CONNECTIONS

C. Eugene Cox, 2738 W. Strawberry La., Santa Ana, Calif. 92701

Filed Nov. 5, 1976, Ser. No. 739,060
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 15 Claims

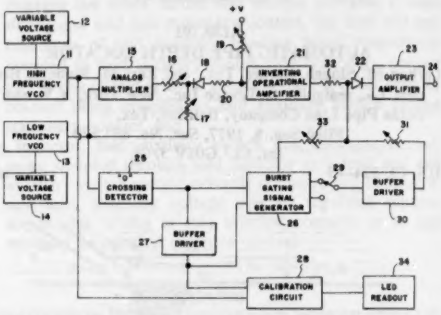


14. In a continuity testing system:
a source of test voltage;
a load impedance and means for connecting the load impedance in series with the source of test voltage;
voltage measuring means for measuring the voltage appearing across said load impedance when the load impedance and test voltage source are connected across terminal points in a circuit to be tested;
means responsive to said voltage measuring means for altering the value of the impedance such that it has a high value when the voltage appearing across the load impedance exceeds the test voltage, and so that it has a lower value when the voltage across the load impedance has a value below the test voltage; and
indicating means comprising said voltage measuring means and means responsive to the voltage measured by said voltage measuring means for indicating whether or not the pair of terminals are or are not interconnected.

4,130,795
VERSATILE LDV BURST SIMULATOR

Otto Youngbluth, Jr., Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 16, 1977, Ser. No. 861,396
Int. Cl.[2] G01R *27/00*
U.S. Cl. 324—57 R 10 Claims

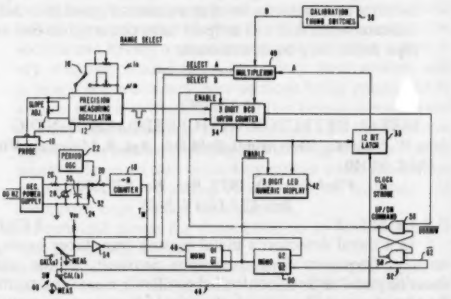


1. A laser doppler velocimeter burst simulator for producing known signals that can be used to determine if a LDV is functioning properly comprising:
means for producing a signal having a frequency equal to the information frequency of said LDV;
means for producing a signal having a frequency equal to the pedestal and envelope frequencies of said LDV;
a modulator means for modulating said information and envelope frequency signals to produce a series of signals with the envelope frequency forming the envelope for the series of signals and with the information frequency signal being the information frequency for the series of signals;
means for adding said envelope frequency signal to said series of signals at the output of said modulating means to form a series of burst signals; and
means for selecting different combinations of the burst signals from said series of burst signals for application to said LDV to determine if it is functioning properly.

4,130,796
CALIBRATING AND MEASURING CIRCUIT FOR A CAPACITIVE PROBE-TYPE INSTRUMENT

Lanson Y. Shum, Salem Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1977, Ser. No. 858,320
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R 6 Claims



1. A calibrating and measuring circuit for a capacitive probe instrument comprising:

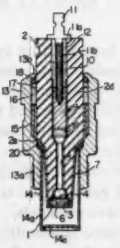
(a) means coupled to said capacitive probe for generating pulses of an adjustable frequency;
(b) means for generating a signal having a time period T_M which is an exact multiple of one over the frequency of the power supply;
(c) means, connected to receive said pulses, for digitally counting up and down, said counting means having an enabling input, a count command input, and a borrow output which is delivered when said counting means reaches zero;
(d) means having an enabling input, connected to the output of said counting means, to display the digital contents of said counting means at the end of period T_M;
(e) means, coupled to said counting means, for storing an offset digital number;
(f) means for generating a digital number signal in the calibration mode;
(g) multiplexer means connected to receive the outputs of said digital number means and said storing means during calibration and measurement, respectively, said multiplexer means having calibration and measurement mode enabling inputs, and having a data output connected to said counting means;
(h) logic control means connected to receive said time period T_M signal as an input, said logic control means being connected to said multiplexer means to respectively enable and disable said multiplexer means for calibration and measurement, said logic means being connected to the enable inputs of said counting means and said display means, said logic means being also connected to said count command input and to said borrow output of said counting means, said logic control means sending a down count command to said count command input upon receiving said T_M signal, and sending an UP count command to said command input upon receiving said borrow signal, said logic control means being connected to said offset digital storing means to command the storage of the digital contents of said counting means at the end of the period T_M, so that during measurement said stored number is the offset number which said counting means must first count down to zero before beginning to count up the pulses received from said oscillator means.

4,130,797

GAS COMPONENT SENSING APPARATUS

Tadashi Hattori, Okazaki, and Hiroaki Yamaguchi, Aichi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 21, 1977, Ser. No. 853,830
Claims priority, application Japan, Nov. 25, 1976, 51/141883; Nov. 25, 1976, 51/141884
Int. Cl.² G01R *27/02*
U.S. Cl. 324—65 P **3 Claims**



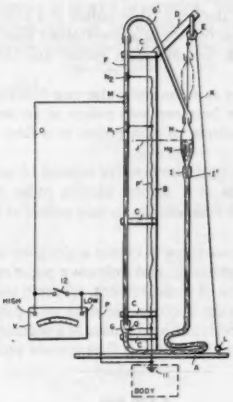
1. A gas component sensing apparatus comprising:
a solid state electrolyte made of metal oxide having an electrical resistance which changes in accordance with a gas component in a gas under test;
a holder made of heat resistive, electrically insulative metal oxide and having an axially extending through-hole formed therein, said solid state electrolyte being held at one end of said through-hole;
a lead member of conductive material fixed to the other end of said through-hole of said holder;
a housing of conductive metal fixed around the outer periphery of said holder;
a pair of electrodes formed on opposite surfaces of said solid state electrolyte in such a manner to prevent electrical shortcircuit therebetween;
a first electrically conductive path means arranged in said through-hole of said holder for electrically connecting one of said pair of electrodes with said lead member; and
a second electrically conductive path means formed in a thin film structure on the outer surface of said holder for electrically connecting the other electrode with said housing;
whereby the change in said electrical resistance of said solid state electrolyte is taken across said lead member and said housing.

4,130,798

UNIMETER FOR DETECTION AND INDICATION OF ELECTRIC CHARGE VARIATION

Arthur H. Maclaren, 135 Livingston St., Tewksbury, Mass. 01876

Filed Nov. 25, 1977, Ser. No. 854,807
Int. Cl.² G01R *31/02*
U.S. Cl. 324—72 **12 Claims**



1. The method of sensing the electric potential of a body and indicating variations thereof comprising the steps of
(a) providing a substantially vertical column of conductive fluid which is movable to position the fluid level at variable vertical positions including a second position opposed and closely spaced from a capacitor electrode and a first position remote from and below said capacitor electrode;
(b) establishing a unipotential initial condition between said conductive fluid column and said capacitor electrode by electrical connection of both to said body and providing an electrometer having a short circuit connection between a low terminal and a high terminal which are connected respectively to said column and said capacitor electrodes;
(c) providing an initial position for the level of said conductive fluid column at said first position remote from said capacitor electrode;
(d) moving said conductive fluid column while in contact with said body up and down between said first and second positions;
(e) removing said short circuit connection between said electrometer terminals prior to the motion of said fluid in the upward direction between said first and second positions;
(f) observing the reading on said electrometer and replacing

said short circuit connection between said electrometer terminals after completing said motion in said upward direction one direction and before moving said fluid in the downward direction; and

(g) after a period of stabilization repeating said steps (d) through (f) to indicate variations in said electric potential of said body from the successive readings of said electrometer.

4,130,799

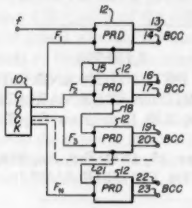
METHOD AND APPARATUS FOR CONTINUOUS FREQUENCY MEASUREMENT

Harvey A. Cherry, 1226 Ferndale Dr., Seabrook, Tex. 77586

Filed Jul. 5, 1977, Ser. No. 813,170

Int. Cl.[2] G01R *23/14*

U.S. Cl. 324—79 D **33 Claims**



1. A method for deriving from pulses at a known pulse rate a continuous logical output in a preselected base, functionally related to pulses at an unknown pulse rate, comprising the steps of:

generating pulses at an output pulse rate functionally related to a difference between said pulses at an unknown pulse rate and a multiple of said pulses at a first known pulse rate;

generating an output functionally related to said difference;

generating pulses at a second known pulse rate having a predetermined relationship to said pulses at a first known pulse rate;

repeating the above steps to obtain a plurality of said outputs functionally related to said unknown pulse rate to a preselected precision of measurement, wherein said pulses at an output pulse rate become the next said pulses at an unknown pulse rate, and said pulses at a second known pulse rate become said pulses at a first known pulse rate.

4,130,800

MAGNETIC PARTICLE TEST SYSTEM USING MOVABLE TEST PIECE CLAMPING MEANS MOVABLE JOINTLY OR INDEPENDENTLY

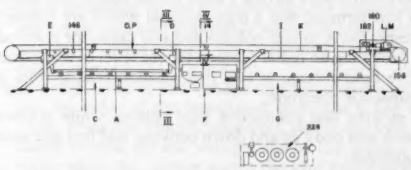
Ernst E. Fuchs, Schmerikon, Switzerland, assignor to Mecafina S.A., Schmerikon, Switzerland

Filed Aug. 25, 1977, Ser. No. 827,607

Claims priority, application Switzerland, Aug. 31, 1976, 11022/76

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—216 **12 Claims**



1. An installation for detecting and marking defective locations in the surface of an elongated rigid workpiece of magnetizable material, comprising at least one pair of clamping devices for engaging the ends of the workpiece and to clamp the workpiece in its longitudinal direction, means for connecting said clamping devices to an electric current source for passing a current through the workpiece so as to create magnetic flux lines of a magnetic field at the surface of the workpiece, guide rail means providing a track for at least one pair of first and second carriages movable along said track and each carrying one of said clamping devices, said guide rail means and carriages serving for conveying the workpiece from a feed station to a delivery station while current is passing through the workpiece, a treatment station arranged between said feed station and said delivery station, so that the work piece travels through the treatment station when it is conveyed from the feed station to the delivery station, said treatment station having a spraying device for spraying a ferromagnetic powder on the surface of the workpiece, and a fixing device for fixing the powder which magnetically adheres to defective locations in said surface, said first and second carriages being associated with a first and a second drive cable, respectively, each having two opposite ends which both are connected to the associated carriage, said drive cables being parallel and each running along said guide rail means and over two return pulleys arranged beyond the feed station and the delivery station, respectively, so that the first and second drive cables each form a closed loop, two drive devices operatively connected to said first and second drive cables, respectively, for moving the corresponding first and second carriages along said track, a clutch coupling for connecting together and disconnecting the two drive devices, for selectively allowing joint or independent movement of the carriages, respectively.

4,130,801

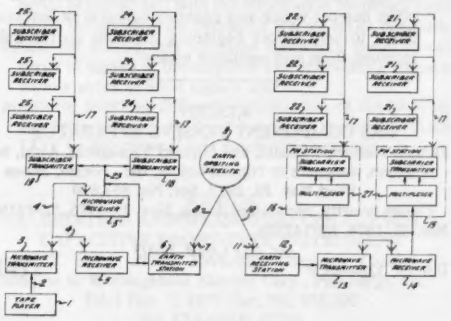
AUDIO MESSAGE BROADCAST SYSTEM

Jack Prygoff, 1088 Rosedale Rd., North Woodmere, N.Y. 11581

Filed Mar. 31, 1976, Ser. No. 672,267

Int. Cl.[2] H04B *7/20*

U.S. Cl. 325—4 **8 Claims**



1. An audio message broadcasting system comprising:

a source of pre-recorded audio messages and means for producing an audio signal corresponding to said messages;

a microwave transmitter connected to said source for transmitting said signal to an earth based transmitting station, and a microwave receiver connected to said earth based transmitting station so that said signal is transmitted from said source to said earth based transmitting station over land based microwave channels;

means at said earth based transmitting station for upwardly transmitting said signal over a first frequency channel to an earth orbiting spin stabilized geostationary satelite for receiving said signal and for translating said first frequency channel to a second frequency channel for downward relay transmission from said satelite;

an earth based receiving station remote from said earth based transmitting station for receiving said signal carried on said second frequency carrier;

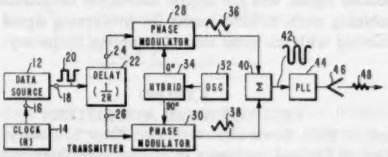
a microwave transmitter connected to said earth based receiving station for transmitting said signal to an FM radio broadcasting station, and a microwave receiver connected to said FM station, so that said signal is transmitted from said earth based receiving station to said FM station over land based microwave channels; and

means for transmitting said signal over subcarrier frequency channels from said FM broadcasting station to subscriber receiving stations for audio broadcast of said prerecorded messages.

4,130,802
UNIDIRECTIONAL PHASE SHIFT KEYED COMMUNICATION SYSTEM

Edward J. Nossen, Cherry Hill, and Vytas F. Volertas, Delran, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,547
Int. Cl.[2] H04L *27/10*
U.S. Cl. 325—30 **9 Claims**



1. In a binary data communication system of the type including a transmitter and receiver, said transmitter comprising a data source means for supplying binary data signals having a predetermined bit period, first means for generating first and second carrier signals, said second carrier signal being substantially in quadrature with said first carrier signal, second means responsive to said first and second carrier signals and said data signals for phase-modulating said first and second carrier signals by said binary data signals, and third means for generating an output signal representative of the sum of said phase-modulated signals, the improvement wherein:

said transmitter further includes fourth means for delaying by substantially half the bit period of said data signals the modulation of one of said first and second carrier signals with respect to the other, whereby phase shifting is effected in steps in a predetermined phasor direction to reduce sidebands in the frequency spectrum of the output signal generated by said third means.

4,130,803
RADIO EQUIPPED PROTECTIVE HELMET

Kenneth L. Thompson, 5201 W. 34th St., #702, Houston, Tex. 77092

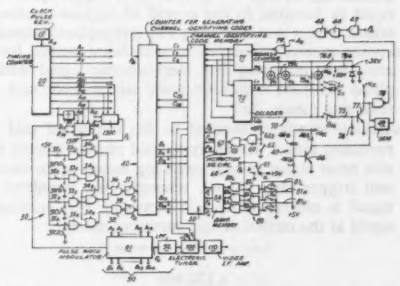
Filed May 4, 1977, Ser. No. 793,236
Int. Cl.[2] H04B *1/08*
U.S. Cl. 325—361 **1 Claim**

1. The combination with a rigid protective helmet constructed and arranged to enclose the forehead, sides and adjacent supporting neck of a wearer's head, one of the sides of the helmet having adjacent apertures for the projection of volume and tuning controls therethrough and the opposite side thereof being provided with an outwardly opening access door; of a thick unitary cushioning pad constructed and arranged to be detachably mounted on the inner peripheral edge surface of said helmet; said unitary pad being substantially symmetrical and having a central portion adapted to engage the forehead and side portions adapted to engage the inner side portions of said helmet; one of said side portions having a radio with tuning and volume controls mounted therein and positioned so that said controls project through said apertures; and an ear phone and a battery positioned in the other of said side portions and being electrically connected with said radio and with each other; said battery being positioned in the outer portion of said pad adjacent said access door for ready replacement thereof.

4,130,804
CHANNEL SELECTING APPARATUS WITH LINEARIZED TUNING

Takao Mogi, Tokyo, and Hisao Okada, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 716,654
Claims priority, application Japan, Aug. 28, 1975, 50-104444
Int. Cl.[2] H04B *1/06*
U.S. Cl. 325—464 **12 Claims**

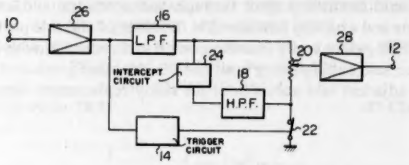


1. A channel selecting apparatus for a television receiver having a tuner with a voltage-controlled, variable reactance device as its tuning element, and in which said tuning element has a non-linear relation between its control voltage and the resulting tuned frequency so that, in different ranges of said control voltage, a predetermined change in said control voltage causes relatively large and small changes, respectively, in said tuned frequency; said channel selecting apparatus comprising sweep pulse generating means operable for producing sweep pulses, counting means for counting said sweep pulses and producing progressively changing binary codes corresponding to the changing counts of said counting means and which represent respective control voltages for said variable reactance device, digital-to-analog converting means receiving said binary codes and converting the same into the respective control voltages for said variable reactance device, and means for automatically varying the repetition rate of said sweep pulses to be higher for the one of said ranges of the control voltage in which said predetermined change in the control voltages causes a relatively small change in the tuned frequency than for another of said ranges in which said predetermined change in the control voltage causes a relatively large change in the tuned frequency.

4,130,805
NOISE CLEARING SYSTEM

Masaharu Mori, Warabi, and Kiyoshi Amazawa, Ohmiya, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,603
Claims priority, application Japan, Apr. 30, 1976, 51/49657
Int. Cl.[2] H04B 1/10
U.S. Cl. 325—473 5 Claims

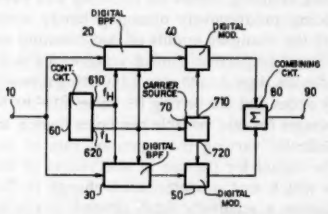


1. An impulsive noise clearing system for an FM stereophonic receiver, comprising:
delay means for receiving and delaying an incoming FM stereophonic signal, including a pilot tone and a subcarrier,
intercept means, connected to the output of said delay means, for intercepting said pilot tone and said subcarrier, and for providing the remainder of said incoming FM stereophonic signal at an output,
phase reversing means, connected to the output of said intercept means, for detecting an impulsive noise signal contained within said incoming FM stereophonic signal and for providing a phase reversed impulsive noise signal,
means for receiving continually said incoming FM stereophonic signal, and for providing a trigger pulse signal equal in duration to the period of impulsive noise contained within said incoming FM stereophonic signal,
summing means, connected to said delay means, for summing said incoming FM stereophonic signal with said phase reversed impulsive noise signal from said phase reversing means, and
switching means, connected to the output of said phase reversing means, for applying said phase reversed impulsive noise signal to said summing means upon receipt of said trigger pulse signal, whereby said impulsive noise signal is cleared from said incoming FM stereophonic signal at the output of said summing means.

4,130,806
FILTER AND DEMODULATION ARRANGEMENT

Petrus J. Van Gerwen; Rudolf A. Van Doorn; Wilfred A. M. Snijders, and Hendrik A. Van Essen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,884
Claims priority, application Netherlands, May 28, 1976, 7605726
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—487 1 Claim

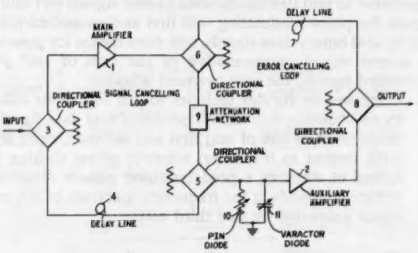


1. An arrangement for filtering and demodulating passband signals which are obtained by modulating a carrier in accordance with a baseband signal whose bandwidth is limited to a given maximum frequency, said arrangement comprising means for filtering the passband signals according to a first and a second bandpass characteristic for generating first and second filtered passband signals, which bandpass characteristics apart from the asymmetrical distortion relative to their central frequency are versions of one another shifted 90° in phase, means for demodulating the first and second filtered passband signals with an inphase carrier and a quadrature carrier respectively for generating first and second demodulated signals, means for combining the first and second demodulated signals, all said means for filtering, demodulating and combining being digital means, the digital filter means including means for sampling frequency reduction for converting signal samples of the passband signals occurring with a first sampling frequency which is higher than twice the highest frequency in the passband signals into signal samples of the first and second filtered passband signals occurring with a second sampling frequency which is not higher than twice said maximum frequency of the baseband signal, and the digital means for demodulating and combining each include means for processing signal samples occurring with the same second sampling frequency.

4,130,807
FEEDFORWARD AMPLIFIERS

Ralph A. Hall, Sawbridgeworth, and Peter E. Radley, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 24, 1977, Ser. No. 809,584
Claims priority, application United Kingdom, Aug. 19, 1976, 34582/76
Int. Cl.[2] H03F 1/26, 3/68
U.S. Cl. 330—124 R 9 Claims



1. A feedforward amplifier comprising:
a main amplifier disposed in a signal canceling loop coupled to an input of said feedforward amplifier;
an auxiliary amplifier disposed in an error cancelling loop coupled between said signal loop and an output of said feedforward amplifier; and
control means directly connected between said error loop and ground for controlling both the amplitude and phase of signals coupled to said output.

4,130,808
PHASE LOCK STABILIZED SWEPT FREQUENCY SIGNAL SOURCE

Michael S. Marzalek, Cotati, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

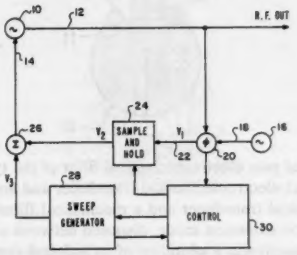
Filed Jun. 9, 1977, Ser. No. 805,195
Int. Cl.[2] H03B 3/04, 23/00
U.S. Cl. 331—14 5 Claims

1. A swept frequency signal source comprising:
a reference frequency signal source;
a variable frequency signal source having a signal output and a control input;
phase lock means connected to the reference frequency and

variable frequency signal sources for producing a control signal for the variable frequency signal source and establishing phase lock between the variable frequency signal source and the reference frequency signal source;

sweep generator means coupled to the variable frequency signal source for producing a periodic sweep signal having a time varying and a constant portion; and

control means connected to the phase lock means and the sweep generator means for causing the phase lock means



to phase lock the input signal of the variable frequency signal source to the output signal of the reference frequency signal source during the constant portion of each sweep signal and, in response to the establishment of said phase lock, for opening the phase lock, storing the control signal and adding the control signal to the sweep signal during the time varying portion of each sweep signal to sweep the frequency of the output signal from the variable frequency signal source starting from a frequency established in accordance with the control signal.

4,130,809
TRAVELLING WAVE LASER

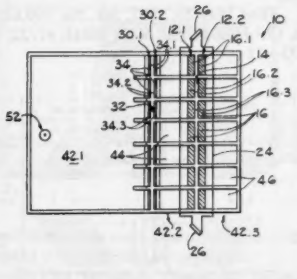
Victor H. Hasson, San Jose, Calif., and Hubertus M. von Bergmann, Pretoria, South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Filed Jan. 31, 1977, Ser. No. 764,106

Claims priority, application South Africa, Feb. 5, 1976, 76/0674

Int. Cl.² H01S *3/097*

U.S. Cl. 331—94.5 PE **7 Claims**



1. A transversely excited travelling wave gas laser comprising:

(a) a pair of elongate main discharge electrodes that define between them a discharge gap, one of the main discharge electrodes being segmented along its length;

(b) a means for immersing the main discharge electrodes in a lasing gas;

(c) a pair of elongate timing electrodes that define between them a timing discharge gap, one of the timing electrodes being segmented along its length, each of the segments of the segmented main discharge electrode being electrically connected with a different one of the segments of the segmented timing electrode;

(d) an electrical insulating means for insulating the segments of the segmented timing electrode from one another and the segments of the segmented main discharge electrode from one another; and

(e) an excitation pulse applying means for applying a voltage pulse across the timing electrodes; the segments of the segmented timing electrode being such that the distance between each of them and the other timing electrode permits discharges between the said other timing electrode and the segments at instances in time to supply sharpened voltage pulses successively to the segments of the segmented main discharge electrode and thereby cause temporally and spatially separated discharges between the two main discharge electrodes to provide a travelling wave laser discharge along the lasing gap in which the excitation front of the discharge travels at the speed of the laser light.

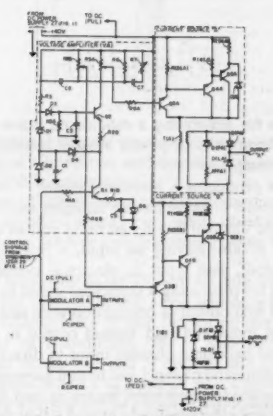
4,130,810
SOLID STATE POWER COMBINER

Ronald M. Wallace, Braintree, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 30, 1977, Ser. No. 814,744

Int. Cl.² H03B *7/06*

U.S. Cl. 331—107 R **1 Claim**



1. In a transmitter of radio frequency energy wherein pulses of radio frequency energy are, in response to control signals periodically produced by a synchronizer, generated by an IMPATT diode, a modulator for converting each successive one of the control signals to an actuating signal for the IMPATT diode, such modulator comprising:

(a) direct current biasing means for continuously applying a direct current signal to the IMPATT diode, the level of such signal being less than the avalanche breakdown level of such diode;

(b) pulse forming means, responsive to each successive one of the control signals, to produce a corresponding voltage pulse having a level always greater than the difference between the level of the direct current signal to the IMPATT diode and the avalanche breakdown level of such diode, the level of such voltage pulse increasing linearly with time;

(c) transformer means, responsive to each corresponding voltage pulse out of the pulse forming means, for coupling to the IMPATT diode an analogous current pulse as an actuating signal for such diode, the level of such analogous current pulse increasing substantially linearly with time; and

(d) clamping means responsive at the end of each actuating

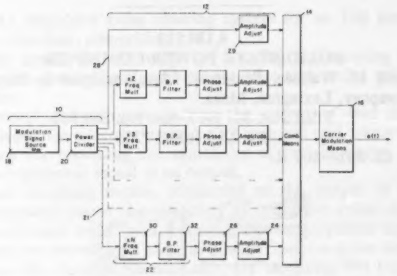
signal to maintain the level of the direct current signal applied to the IMPATT diode at a constant value.

4,130,811

MODULATION SYSTEM

Joel Katz, Los Angeles, and Eugene H. Gregory, Tarzana, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 27, 1977, Ser. No. 864,946
Int. Cl.² H03C 3/00
U.S. Cl. 332—18 **11 Claims**



1. Apparatus for generating a modulated wave having the first three sideband pairs of power closely approximating the carrier which comprises:

(a) means for producing a sinusoidal signal;

(b) a fundamental channel having an input and an output;

(c) a harmonic channel having an input and an output;

(d) a power divider having an input, a first output and a second output, said input in electrical connection with said means for producing a sinusoidal signal to accept said signal, said first output in connection with said fundamental channel input and said second output in connection with second harmonic channel input to direct said signal to said fundamental channel and to said harmonic channel;

(e) a first amplitude adjustment means in said fundamental channel to scale the amplitude of said signal to β where β is the solution of $J_0(\beta) = J_1(\beta)$;

(f) a second amplitude adjustment means is said harmonic channel to scale the amplitude of said signal to β;

(g) a frequency adjustment means to transform the frequency of said signal within said harmonic channel to two times a fundamental frequency ω_m and to transform the frequency of said signal within said fundamental channel to the fundamental frequency ω_m;

(h) a phase shift means is said harmonic channel to advance said signal in phase by 90°;

(i) a power combiner having a fundamental channel input, a harmonic channel input and an output to add the output of said fundamental channel to that of said harmonic channel;

(j) a voltage controlled phase shifter having a control input and a carrier input and an output channel;

(k) a carrier signal source to supply a sinusoidal carrier signal to the carrier input of said voltage controlled phase shifter; and

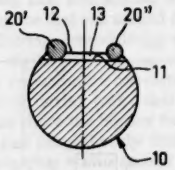
(l) the output of said power combiner being input to said control input of said voltage controlled phase shifter whereby the carrier signal is phase modulated by the output of said power combiner.

4,130,812

BAND PASS ELECTROMECHANICAL FILTERS

Michel G. Berniere, Louveciennes, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed May 2, 1977, Ser. No. 793,064
Claims priority, application France, May 15, 1976, 76 13345
Int. Cl.² H03H 9/02, 9/26
U.S. Cl. 333—71 **3 Claims**



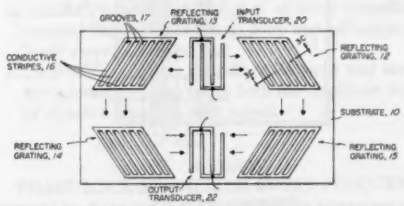
1. A band pass electromechanical filter of the type comprising an input electromechanical transducer and an output electromechanical transducer and a mechanical filter vibrating in compression-extension mode, disposed between said transducers and comprising a plurality of cylindrical resonators connected to one another by coupling rods, each resonator being formed with a flat portion at the end (s) upon which at least one coupling rod is secured, the plane of said flat portion being parallel to the longitudinal axis of the resonator, each coupling rod being welded onto said flat portion along one generatrix thereof, said generatrix being parallel to the resonator axis, each coupling rod having its end in abutment with a shoulder which terminates the flat portion, the cross-sectional area of the resonator outside the flat portion being equal to the sum of the cross-sectional area of the resonator in the section comprising the flat portion and the cross-sectional area of the coupling rod (s) secured on said flat portion.

4,130,813

SURFACE WAVE DEVICE HAVING ENHANCED REFLECTIVITY GRATINGS

Frank Sandy, Lexington, and Clarence J. Dunnrowicz, Waltham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 23, 1977, Ser. No. 799,622
Int. Cl.² H03H 9/02, 9/26; H01L 41/22, 41/10
U.S. Cl. 333—72 **22 Claims**



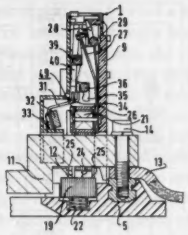
1. In combination:

a substrate for supporting surface wave propagation; and one or more means for reflecting surface waves upon said substrate, said reflecting means having a plurality of substantially parallel grooves within said substrate and a plurality of metal stripes positioned on the surface of said substrate, one of said stripes being located between adjacent ones of said grooves, the width of said grooves and said metal stripes being substantially one-half the wavelength of said reflected surface waves.

4,130,814
INTERCHANGEABLE TRIPPING DEVICE FOR A CIRCUIT-BREAKER

Michel Bruchet, St-Quentin, France, assignor to UNELEC S.A., Paris, France

Filed Apr. 13, 1977, Ser. No. 787,267
Claims priority, application France, Apr. 21, 1976, 76 11688
Int. Cl.[2] H01H *71/74*
U.S. Cl. 335—42 8 Claims

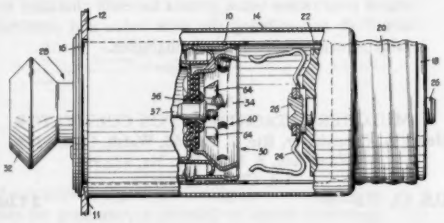


1. An interchangeable tripping device for a circuit-breaker, wherein the circuit-breaker comprises a casing, a current-passing conductor and a control mechanism operable by the tripping device to break the circuit of the current-passing conductor; said tripping device including excess current detection means constituted as a magnetic circuit which, in operation, surrounds the current-passing conductor, the magnetic circuit being made of two separable parts, one of which is installed in said casing and the other separable part being removable and integral with said interchangeable tripping device such that replacement of the interchangeable tripping device in the circuit-breaker can be made without disconnection of the current-passing conductor of the circuit breaker.

4,130,815
FORMED HEATING RIBBON AND COIL

Laurence G. Horwitt, New Haven; Donald J. Mattis, Norwalk, and Harry Greenberger, Bridgeport, all of Conn., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Sep. 13, 1977, Ser. No. 832,834
Int. Cl.[2] H01C *3/00*
U.S. Cl. 338—282 4 Claims



1. An electric heating element comprising, in combination:
(a) a tight spiral coil of metal heater ribbon,
(b) current-carrying members connected respectively to inner and outer portions of said spiral ribbon, to enable the latter to be electrically energized,
(c) the convolutions of said ribbon having an insulating oxide coating to minimize electrical conduction between contiguous adjacent coil portions,
(d) said ribbon having a cross-sectional shape which produces a bulbous surface on one side and which is characterized by a substantially flat central portion, opposite side flange portions each extending angularly on the same side of the flat central portion and each being of thinner section than said flat central portion, the free edges of said flange portions having longitudinal beads on those sides which are part of the bulbous surface of the ribbon.

4,130,816
CIRCUMFERENTIAL ACOUSTICAL DETECTOR

Charles B. Vogel, and Gene T. Worrell, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 28, 1977, Ser. No. 819,806
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—15.5 BH 15 Claims

1. An acoustical logging tool for obtaining a circumferential acoustic log of a borehole, said logging tool comprising:
an elongated housing;
a plurality of elongated arms, said arms comprising flat spring members having one end secured to said housing and having the free ends extending along the axis of said housing;
actuating means mounted in said housing, and disposed to extend the free end of said arms, said arms being retracted by the biasing force of said flat spring members;
a plurality of transducers, one of said transducers being mounted on the free end of each of said arms;
circuit means coupled to some of said transducers to energize said transducers to produce acoustical impulses;
additional circuit means coupled to the remainder of said transducers to receive said acoustical impulses and transmit related signals to the surface; and,
recording means, said additional circuit means being coupled to said recording means to separately record said related signal.

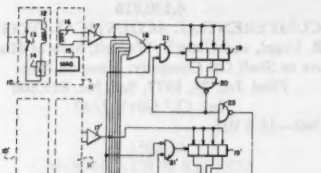
4,130,817
TIRE PRESSURE WARNING DEVICES

William F. Hill, Stafford, and Allan E. Clark, Lichfield, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England

Filed Jan. 8, 1976, Ser. No. 647,401
Claims priority, application United Kingdom, Jan. 14, 1975, 1482/75
Int. Cl.[2] B60C *23/02*
U.S. Cl. 340—58 12 Claims

1. A tire pressure warning device comprising the combination of a non-rotating assembly for mounting on a non-rotating part of a vehicle and including a pick-up, and a rotating assembly for mounting on a wheel of the vehicle so that it passes adjacent the non-rotating assembly, said rotating assembly including a single coil adapted to be energized by movement of the rotating assembly past the non-rotating assembly, a pres-

sure actuated switch sensitive to tire pressure and arranged to close at normal tire pressure, and synchronizing switch means operable to permit release of the energy stored by said coil



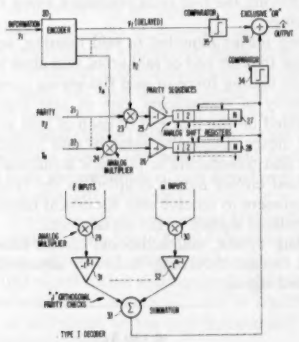
whilst said coil is adjacent said pick-up, said single coil, pressure actuated switch and synchronizing switch means being arranged in series, the arrangement being such that said release of energy is prevented if the pressure operated switch opens.

4,130,818

ANALOG THRESHOLD DECODING

John S. Snyder, Jr., Monrovia, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Apr. 21, 1977, Ser. No. 789,589
Int. Cl.[2] G06F *11/12*
U.S. Cl. 340—146.1 AQ **25 Claims**



1. An analog threshold decoder for decoding convolutionally-coded information and parity sequences with digital information which contains transmission errors comprising:

an array of analog storage devices for receiving the information and parity sequences, each of said analog storage devices having a plurality of stages, selected stages having stage taps for producing outputs;

an analog summation means connected to said analog storage device stage taps for summing analog storage device outputs; and

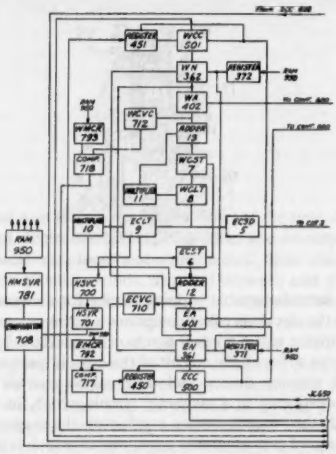
a comparator means connected to the output of said summation means, said comparator means producing an output which is a binary "1" if the output of said summation means is positive, and a binary "0" if the output of said summation means is negative.

4,130,819

OPTICAL CHARACTER RECOGNITION DEVICE

Rudolph H. Engelmann, St. Paul, Minn., assignor to Hildegarde Seifried, North Hollywood, Calif. and John W. Adams, Minneapolis, Minn.

Filed Jun. 22, 1977, Ser. No. 808,912
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 AC **32 Claims**



1. A method of electronically recognizing characters, comprising:

scanning an area containing characters to be identified and producing electrical signals indicative of scanning positions at which input material of the characters is present;

producing style value criteria for each character to be identified by counting the number of signal producing transitions from each scanning operation;

producing penetration value criteria for each character to be identified by sensing the distance from a predetermined reference location to signal producing portions of the character disposed closest to said reference location;

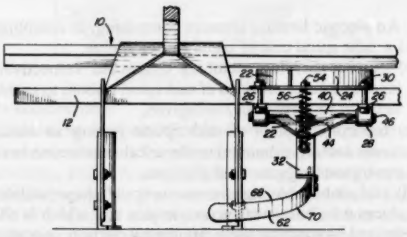
deriving style value and penetration value signals respectively indicative of the sensed style value criteria and the sensed penetration value criteria for each character to be identified; and utilizing the style value and penetration value signals to identify each character.

4,130,820

MULCHER ATTACHMENT FOR CULTIVATOR

Henry A. Copenhaver, Rte. 2, Box 65, Walsh, Colo. 81090

Filed Aug. 8, 1977, Ser. No. 822,994
Int. Cl.[2] A01B *35/24*
U.S. Cl. 172—707 **3 Claims**



1. A mulcher attachment for mounting on the rock shaft of a draft implement, said attachment including bracket means for

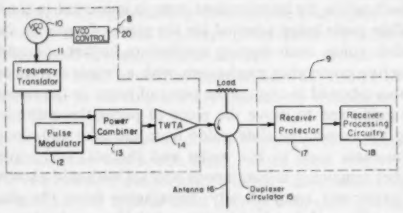
attachment to said rock shaft, a swing arm having front and rear ends, pivot means pivotally supporting said front end from said bracket means for angular displacement of said arm relative to said bracket about a horizontal axis extending transversely of said arm, the rear end of said arm being inclined downwardly and rearwardly from said bracket means, positioning and limit means operatively connected between said bracket means and arm limiting the downward inclination of said arm relative to said bracket means, allowing upward swinging of the rear end of said arm toward a horizontal position and including force means yieldingly biasing said arm toward its limit of downward inclination, the rear end of said arm including a smoothly laterally curving terminal end constructed of spring material, the front end of the arm including forwardly divergent brace members spaced on opposite sides of the forward terminal end portion of said arm, a sleeve extending and secured between the forward ends of said braces and said forward terminal end portion of said arm, said bracket means comprising a pair of brackets for mounting on said rock shaft at points spaced therealong, a pivot shaft journaled through said sleeve and having its opposite ends supported from said pair of brackets, one of said brackets including a rearwardly projecting arm portion terminating rearwardly over said arm intermediate its front and rear ends, said force means comprising an elongated coiled compression spring, said positioning and limit means including an elongated upstanding rod slidably secured through said arm portion and swing arm at the upper and lower ends thereof, respectively, said compression spring being telescoped over said rod between opposing portions of said bracket means and arm between which said rod extends.

4,130,821

FREQUENCY-AGILE FIRE CONTROL RADAR SYSTEM

Harry Goldie, Randallstown, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1977, Ser. No. 785,974
Int. Cl.[2] G01S *7/28*
U.S. Cl. 343—17.1 R **13 Claims**



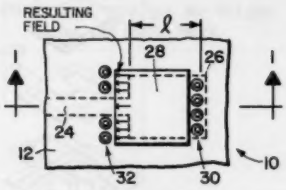
1. An improved signal processing system comprising:
means for generating a plurality of signals including,
means for generating a CW rf signal,
frequency translator means for forming a signal offset in frequency from said CW rf signal,
means for pulse modulating said offset frequency signal,
power combiner means for combining said CW and pulse modulated rf signals, and
means for amplifying said combined signals;
means coupled to said generator means for transmitting and receiving said signals; and
means coupled to said transmitting and receiving means for limiting any of said received signals having a power level above a predetermined threshold and passing any signal having a power level below said predetermined threshold, said means for limiting including a broad band frequency selective limiter.

4,130,822

SLOT ANTENNA

Peter J. Conroy, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1976, Ser. No. 701,481
Int. Cl.[2] H01Q *1/38*
U.S. Cl. 343—700 MS **5 Claims**



1. An antenna having improved bandwidth characteristics which is suitable for conformal arraying, comprising:
ground plane conductor means;
rectangular transmission means for forming a radiating element which is spaced from said ground plane conductor means;
dielectric spacing means for separating said ground plane conductor means and said rectangular transmission means;
said rectangular transmission means having one end of the length thereof being shorted to said ground plane conductor means with the other end of the length thereof being open circuited, said rectangular transmission means having an optimum feedpoint at a predetermined distance from said short circuited edge so that the input of the antenna at said predetermined distance from said shorted end is matched to a real impedance value;
additional ground plane conductor means being shorted to said ground plane conductor means and surrounding said rectangular transmission means such that a U-shaped slot is formed about the width and open circuited end of said rectangular transmission means; and
feed means for coupling energy to said input of the antenna whereby energy is radiated from the antenna.

4,130,823

MINIATURE, FLUSH MOUNTED, MICROWAVE DUAL BAND CAVITY BACKED SLOT ANTENNA

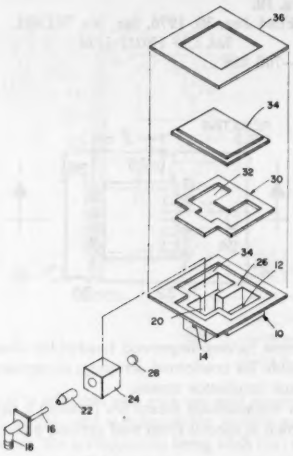
Gary R. Hoople, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1977, Ser. No. 822,105
Int. Cl.[2] H01Q *13/18*
U.S. Cl. 343—768 **3 Claims**

1. A miniature, flush mounted, microwave dual band antenna comprising:
(a) an antenna body of a conductive material having an approximately Y-shaped cavity with a central vane and having an input port at the base of said Y-shaped cavity;
(b) a block of a dielectric material having a central hole, said block being situated in the leg of said Y-shaped cavity with said central hole aligned with said input port;
(c) a probe situated within said hole in said block and electrically insulated from said central vane, said probe having a central hole aligned with said input port into which the center conductor of a coaxial rf transmission line is inserted to excite said probe so that when said probe is excited said antenna resonates a lower frequency band energy primarily in the open non-dielectric spaces of said cavity, and resonates a higher frequency band energy primarily in the dielectric space of said block;
(d) an aperture plate having a slot enclosing the open end of said cavity, the configuration of said slot being a function

of the desired polarization of the energy radiated in the lower frequency band;

(e) a dielectric window which covers said slot; and



(f) a cover having an opening to accommodate said dielectric window which is attached to said antenna body to hold said dielectric window and said aperture plate in place.

4,130,824

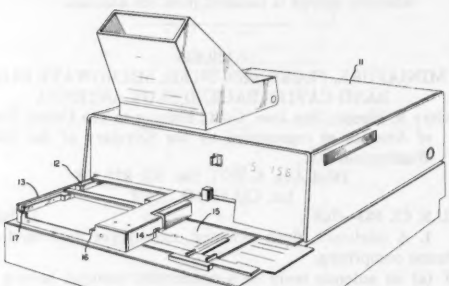
RECORDING ANALYZER FOR ELECTROPHORETIC SAMPLES

Lynn G. Amos, Corning; Howard F. Banks, Horseheads, both of N.Y.; Robert T. Buck, Raleigh, N.C., and William R. Eppes, Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 24, 1977, Ser. No. 799,942

Int. Cl.[2] G01D *5/26*

U.S. Cl. 346—33 A **11 Claims**



1. An analyzer for fluorescing or absorbing samples comprising:

a fixedly mounted source of analysis energy;

a sample stage having a sample holder,

a transport mechanism for linearly moving said sample stage with respect to said source to scan said sample across said source;

detection means for generating an electrical signal representing the fluorescence or absorption characteristics of said sample as it is scanned across said source, said detection means being fixed with respect to said source;

a recorder pen mounted on said stage and moved along a chart by the same movement which scans said sample across said source, said recorder pen being driven by said electrical signal in a direction orthogonal to the direction of said movement to produce a record of the fluorescence or absorption characteristics across said sample, said record having the same length as the length of the sample which is scanned.

4,130,825

APPARATUS FOR AUTOMATICALLY TREATING PIECES OF EXPOSED PHOTOSENSITIVE PAPER

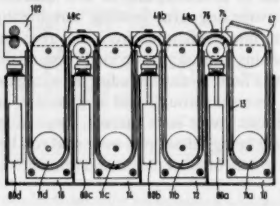
Osvaldo Fasano, Turin, Italy, assignor to Morenar S.A., Fribourg, Switzerland

Filed Apr. 13, 1977, Ser. No. 787,095

Claims priority, application Italy, Apr. 13, 1976, 67859 A/76; Nov. 26, 1976, 69824 A/76

Int. Cl.[2] G03D *3/12*

U.S. Cl. 354—322 **9 Claims**



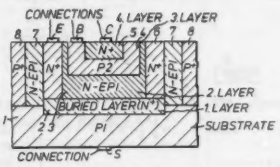
1. Apparatus for automatically treating pieces of exposed photosensitive paper, comprising at least three tanks each of which is adapted to contain a respective treatment bath; at least three dipping mechanisms sequentially actuated, each associated with a respective one of the tanks for sequentially dipping one at a time of said pieces of paper into the respective bath, each dipping mechanism comprising a respective slide guide having an inlet end and an outlet end and an intermediate zone arranged so that, in use, the inlet and outlet ends are external to the bath while the intermediate zone is immersed in the bath, the slide guide being adapted for the piece of paper to slide in the slide guide, each dipping mechanism further comprising a respective conveying mechanism with a respective travelling member adapted to engage the piece of paper in the respective slide guide and to move the piece of paper the entire length along the respective slide guide from the inlet end along the intermediate zone to the outlet end thereof, said travelling member remaining in continuous contact with said photosensitive paper and automatically disengaging from the piece of paper at the outlet end; at least two transfer mechanisms, each arranged between a respective pair of said dipping mechanisms and each comprising a respective slide guide adapted for the piece of paper to slide therein and extending from the outlet end of the slide guide of one dipping mechanism of the said pair to the inlet end of the slide guide of the other dipping mechanism of the said pair, each transfer mechanisms comprising a respective conveying mechanism including at least one respective travelling member adapted to engage the piece of paper in the respective slide guide and to move the piece of paper along the slide guide; control means adapted to stop said photo sensitive piece of paper at a stop position in each dipping mechanism for a period of time while the piece of paper is immersed in the respective bath; and

means for stirring said treatment bath, said stirring means adapted to stir the bath in a zone in close proximity to the stop position of the piece of photosensitive paper in the bath, said stirring means having at least one vertically lamellar blade extending into the respective bath.

4,130,826
MONOLITHIC INTEGRATED SEMICONDUCTOR CIRCUIT

Erich Bachle, Ulm; and Hermann Clauss, Leingarten, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 3, 1976, Ser. No. 747,222
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2555047
Int. Cl.[2] H01L 29/72
U.S. Cl. 357—34 24 Claims



1. A monolithical semiconductor circuit including an integrated semiconductor array having a plurality of low ON-state resistance switching transistors formed in a common semiconductor body in bipolar technology, particularly for use in switching networks of telephone exchanges and transmission devices, for selectively connecting a series of input lines as desired to one or several output lines, each of said switching transistors being constructed as a vertical NPN transistor which has a large downward current amplification factor and a large upward current amplification factor and is characterized by the following features:

(a) a first selective layer of a second type of conductivity opposite to a first type of conductivity introduced into a substrate region of said semiconductor body and of said first type of conductivity,

(b) a less heavily doped second layer of said second type of conductivity epitaxially grown on said first layer,

(c) a third layer of said first type of conductivity selectively introduced into said second layer,

(d) a fourth layer having as large an area as possible of said second type of conductivity selectively introduced into said third layer,

(e) a region of said second conductivity type encircling said second, third and fourth layer, which form said vertical NPN transistor, and forming a largely tank shaped region of said second type of conductivity with said first layer,

(f) said tank shaped region is surrounded by a first frame-like region of said second type of conductivity,

(g) said first frame-like region is surrounded by a second frame-like region of said first type of conductivity, said second frame-like region extending from the surface of said semiconductor body to said substrate, being more highly doped than said substrate and serving to insulate said vertical NPN transistor, and

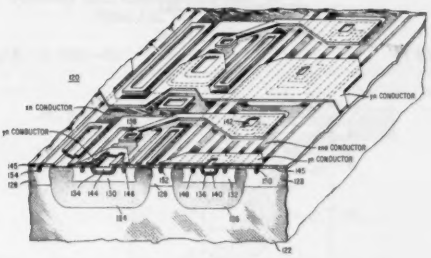
(h) said substrate, said tank-shaped region, and said third and fourth layer are provided with respective connections;

and wherein, for each of said switching transistors, said connection of said tank shaped region and the connection of said fourth layer are connected to the respective input and output lines to be switched through, said connection of said third layer is connected to a triggering circuit for the associated switching transistor and, as desired, to a control circuit, and said connection of said substrate is connected to a dc voltage potential which is negative with respect to said tank shaped region.

4,130,827
INTEGRATED CIRCUIT SWITCHING NETWORK USING LOW SUBSTRATE LEAKAGE CURRENT THYRISTOR CONSTRUCTION

Frederick A. D'Altroy, Center Valley, Pa.; Adrian R. Hartman, Westfield, N.J.; Richard M. Jacobs, Allentown; Robert L. Pritchett, Bath, both of Pa., and Peter W. Shackle, Bridgewater, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 3, 1976, Ser. No. 747,366
Int. Cl.[2] H01L 29/74
U.S. Cl. 357—38 9 Claims



1. A low voltage, low current junction isolated integrated circuit thyristor for use in high density crosspoint arrays comprising:

a substrate comprising a bulk and an upper portion that are both of a first conductivity type the substrate being adapted to be electrically connected to a first bias operating voltage source;

a first region of a second conductivity type contained within portions of the bulk and upper portion of the substrate, the first region being adapted to be electrically connected to a reference bias operating voltage source, the first region being characterized in that a portion thereof extends completely through the upper portion of the substrate so as to completely isolate a portion of the upper substrate;

the isolated portion of the upper portion of the substrate defining a second region;

a third region of the same conductivity type as the first region and being contained in a portion of the second region;

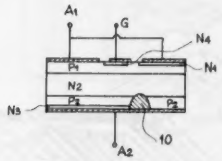
a fourth region of the same conductivity type as the second region and being contained within a portion of the third region; the fourth region being adapted to be electrically connected to a second bias operating voltage source;

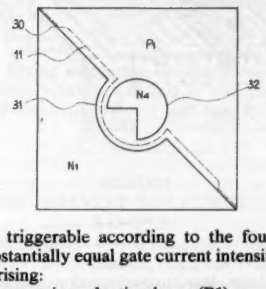
a background level of recombination centers in said first region; means for suppressing the current gain of the parasitic transistor formed by the substrate, the first region, and the second region comprising additional recombination centers in said first region in combination with sufficient vertical thickness and dopant concentration of said first region, and means for supplying said first, second, and reference bias operating voltage sources, the resulting leakage current associated with transistor action in the parasitic transistor is less than one part in ten thousand of the current conducted between the fourth and first regions.

4,130,828
TRIAC STRUCTURE HAVING IMPROVED TRIGGERING SENSITIVITY WITH SINGLE GROOVE EXTENDING FROM GATE REGION

Rene Locqueneux, Paris, France, assignor to Silec-Semi-Conducteurs, Paris, France

Continuation of Ser. No. 732,373, Oct. 14, 1976, abandoned.
This application Mar. 28, 1978, Ser. No. 891,125
Claims priority, application France, Oct. 16, 1975, 75 31733
Int. Cl.[2] H01L 29/747
U.S. Cl. 357—39 3 Claims





1. A triac triggerable according to the four polarization modes by substantially equal gate current intensities in the four modes comprising:

a first P-type semi-conductive layer (P1)

a second N-type semi-conductive layer (N2)

a third P-type semi-conductive layer (P2)

a first N-type region (N4) coated on a small area part of the first P-type layer (P1) and serving as a single gate for the triac,

a second N-type region (N1) coated on a relatively large surface of the first P-type layer (P1) and not connecting the first N-type region (N4), the second region (N1) and the first layer (P1) presenting, in a top view, a first boundary line,

a third N-type region (N3) coated on a relatively large surface of the third P-type layer (P2), and presenting a second boundary line therewith, the improvement being that the projections of the first and second boundary lines on a plan parallel to the plan of the layers are substantially similar, the second and third N-type regions (N1) and (N3) lying, in projection, in substantially complementary regions, and a single groove being formed from the surface comprising the third region (N3), said single groove being substantially centered on said boundary lines and extending from the side of the triac opposite the side in which the gate is formed.

4,130,829
APPARATUS FOR ADJUSTING OPERATING CONDITIONS OF A CATHODE RAY TUBE

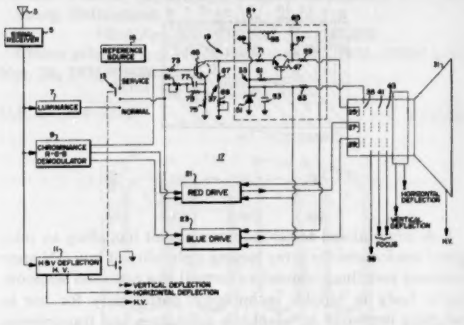
George H. Kam, Tonawanda, N.Y., and Robert P. Logan, Framingham, Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 716,124, Aug. 20, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,321
Int. Cl.[2] H04N 9/62, 9/20
U.S. Cl. 358—10 16 Claims

1. In a color television receiver having chrominance, luminance, and reference signal sources and a color cathode ray tube having a plurality of electron guns each with an associated cathode electrode, a control grid electrode, and a screen grid electrode with the control grid electrodes and the screen grid electrodes of the electron guns having a common connection, a cathode ray tube operating condition adjusting apparatus comprising:

switching means having a "normal" positional location for selective coupling to said luminance signal source and a "service" positional location for selective coupling to said reference signal source;

matrixing and amplifying means coupled to said chrominance signal source and to said switching means for selective coupling to said luminance signal source during "normal" operation and to said reference signal source during



"service" operation, said matrixing and amplifying means comprising:

(a) a plurality of drive amplifiers;

(b) a plurality of cathode DC bias potential adjustment means coupled to respective ones of said drive amplifiers to effect adjustment of the DC bias applied by said matrixing and amplifying means to said cathode electrodes of said color cathode ray tube whereby electron beam cut-off of each of said electron guns is effected when said switching means is in the "service" positional location; and

(c) control grid DC bias potential development means connected to the drive amplifiers and coupled by an impedance to said common connected control grid electrodes of said color cathode ray tube.

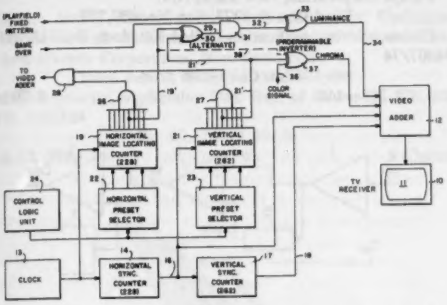
4,130,830
METHOD AND APPARATUS FOR HOMOGENEOUS EXPOSURE OF VIDEO DISPLAY SCREEN

Richard B. Derickson, Sunnyvale, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Sep. 14, 1977, Ser. No. 832,999
Int. Cl.[2] H04N 5/22
U.S. Cl. 358—22 9 Claims

1. A method of exposing the entire viewing area of a video display screen to the same amount of luminance where the screen normally displays a fixed pattern for prolonged periods of time comprising the following steps: generating a signal for providing a moving pattern across said screen; exclusively ORing said moving pattern signal with a signal corresponding to said fixed pattern; and driving said video display screen with the logical result of the previous step.

6. A method as in claim 1 where said fixed pattern includes a color component provided by a color signal said method



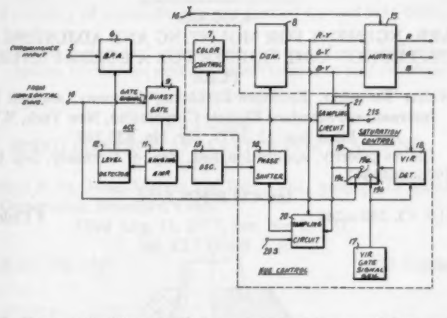
including the step of complementing said color signal in accordance with said moving pattern.

4,130,831

COLOR TELEVISION CONTROL CIRCUIT FOR USE WITH A VIR SIGNAL

Katsuo Isono, Kawagoe, and Seiji Sanada, Yokosuka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 753,868
Claims priority, application Japan, Dec. 26, 1975, 50/157204
Int. Cl.[2] H04N *9/535*
U.S. Cl. 358—27 **11 Claims**



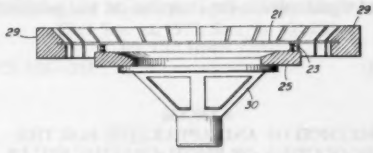
1. Color television receiving apparatus for receiving and demodulating a composite color television signal including horizontal synchronizing signals, color burst signals, a luminance component and a chrominance component, said composite color television signal being of the type which additionally may include a VIR signal provided in a predetermined line interval during the vertical retrace interval, said apparatus comprising means for separating and demodulating said chrominance component into color signal components; first signal means for providing a VIR gate pulse during the predetermined line interval in which said VIR signal is provided; second signal means for providing a burst gate pulse which is time coincident with said color burst signals that are received; switch means for receiving both said VIR gate pulse and said burst gate pulse and for selectively supplying one of said received gate pulses to an output thereof; VIR detecting means coupled to said demodulating means and to said first signal means, said VIR detecting means including a sampling circuit responsive to said VIR gate pulse to sample a selected one of said color signal components for producing a switch control signal as a function of said sampled color signal component if said VIR signal is present, said switch means being coupled to and controlled by the switch control signal produced by said VIR detecting means for supplying said VIR gate pulse to its output if said VIR signal is present and for supplying said burst gate pulse to its output if said composite color television signal does not include said VIR signal; sampling means coupled to said switch means and to said demodulating means and responsive either to said VIR gate pulse or to said burst gate pulse, as supplied by said switch means, to sample selected components produced by said demodulating means; control means responsive to said sampled selected components for controlling the hue and/or saturation characteristics of the demodulated color signal components; and manually operable adjusting means coupled to said sampling means for selectively varying the signals produced by said sampling means in accordance with an operator's preference for particular hue and/or saturation characteristics of a color video picture reproduced from said demodulated color signal components.

4,130,832

THREE-DIMENSIONAL DISPLAY

Lawrence D. Sher, Acton, Mass., assignor to Bolt Beranek and Newman Inc., Cambridge, Mass.

Filed Jul. 11, 1977, Ser. No. 814,711
Int. Cl.[2] H04N *9/54*
U.S. Cl. 358—89 **11 Claims**



1. A three-dimensional display system comprising:

a circular reflective plate having substantial stiffness and resilience;

weighting means attached to and distributed around the rim of said plate, the mass of said weighting means being greater than that of the plate itself;

means for compliantly supporting said plate along a concentric circular locus which is substantially inside of the rim of said plate;

means for applying an oscillatory force to said plate to drive the plate into oscillation with the motion of the rim being out-of-phase with the motion of said central portion; and

means for generating, in a plane, successive image components which are produced in synchronization with the oscillation of said plate at different phases thereof, the image-generating means being positioned so as to be viewable by way of said reflective plate, whereby the image components so viewed appear juxtaposed in space in accordance with the variation in effective focal length of said mirror.

4,130,833

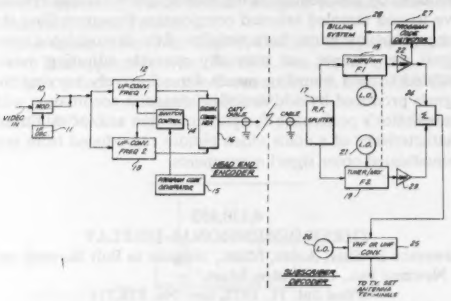
PAY TELEVISION SYSTEM

Marc Chomet, East Northport, N.Y., assignor to Teleglobe Pay-TV System, Inc., Rego Park, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,653
Int. Cl.[2] H04N *7/16, 7/00*
U.S. Cl. 358—122 **3 Claims**

1. In a pay television system having transmitting means for transmitting a television signal at a first output frequency during first selected time intervals and at a second output frequency during second selected time intervals excluding said first selected time interval, a receiving system comprising, in combination, a television receiver; first receiver means (18) tuned to said first output frequency and rejecting said second output frequency for receiving said encoded television signal and changing said first output frequency to a predetermined decoder frequency, thereby creating a first decoder signal; second receiver means (19) tuned to said second output frequency and rejecting said first output frequency for receiving said encoded television signal and changing said second output

frequency to said predetermined decoder frequency thereby creating a second decoder signal, said first and second decoder signals having the same frequency but occurring alternately; and summing means (22–24) continously and simultaneously



connected to both said first and second receiver means for summing said first and second decoder signal and furnishing a combined signal suitable for reception on said television receiver.

4,130,834

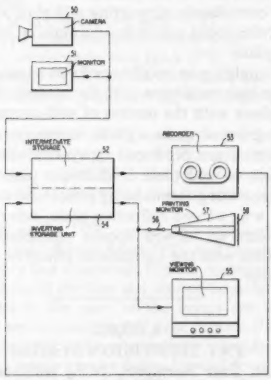
METHOD OF AND APPARATUS FOR THE PRODUCTION OF PHOTOGRAPHIC STILLS

Adolf Mender, Ottobrunn, and Horst Schmidt, Bad Honeff, both of Germany, assignors to Videoprint Gesellschaft fur Industrie-Fernsehen mbH, Ottobrunn, Germany

Filed Dec. 20, 1974, Ser. No. 535,150

Int. Cl.[2] H04N *9/02, 7/18*

U.S. Cl. 358—127 **16 Claims**



1. A method for producing and processing photographic quality video signals comprising the steps of:

converting an optical image into a video signal by high resolution electronic scanning at a scanning rate of at least about 1,000 lines per image wherein the exposure time for producing the video signal is less than about 10 milliseconds;

writing said video signal into intermediate storage, the time for writing said video signal into intermediate storage being less than about 40 milliseconds; and,

reading said video signal out of intermediate storage into permanent storage, the time for writing the video signal into intermediate storage being shorter than the time for reading the video signal out of intermediate storage into permanent storage.

4,130,835

ELECTRICAL WAVEFORM ANALYSIS

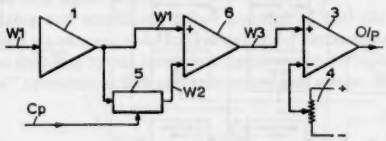
Leslie H. Guildford, Haywards Heath, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1975, Ser. No. 637,777

Claims priority, application United Kingdom, Dec. 13, 1974, 54007/74

Int. Cl.[2] H03B *3/04*

U.S. Cl. 358—160 **6 Claims**



1. A circuit arrangement for detecting changes in amplitude of a video signal, said circuit arrangement comprising input means for receiving the video signal in real time, sampling means for producing at least one sample of the received video signal in each picture element period of the video signal, hold and delay means for delaying each sample for a duration of from one to two picture element periods, comparison means for comparing the amplitude of each delayed sample with the amplitude of the real time video signal to produce a resultant sample having a parameter indicative of the difference of said amplitudes and threshold means responsive to the resultant sample to produce an output signifying a detected change in amplitude of the video signal when said parameter exceeds a threshold value.

4,130,836

ARRANGEMENT FOR MOUNTING AND ADJUSTING A DEFLECTION-COIL HOLDER FOR A COLOR-PICTURE TUBE

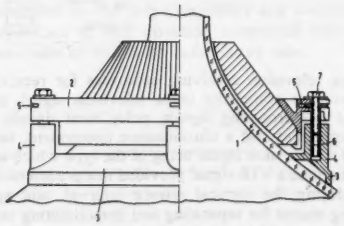
Walter Kornaker, Esslingen-Berkheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,262

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 2641847

Int. Cl.[2] H04N *5/64*

U.S. Cl. 358—248 **5 Claims**



1. An arrangement for mounting and adjusting a deflection-coil holder for a color-picture tube comprising:

a mounting member connected to the conical portion of an envelope of said tube;

at least three sleeve carriers are secured to said mounting member;

a guide groove in each of said carriers;

straddling dowels floatingly retained in each of said guide grooves and each bore in said sleeve carriers, said straddling dowels being attached to said deflection-coil holder; and

screws to be screwed into each of said straddling dowels where tightening of said screws controls the depth of immersion of said straddling dowels into said bores of said sleeve carriers and the position of said straddling dowels in said guide grooves of said deflection-coil holder is fixed.

4,130,837

ARRANGEMENT FOR MOUNTING THE DEFLECTION SYSTEM ON THE ENVELOPE OF A COLOR-PICTURE TUBE

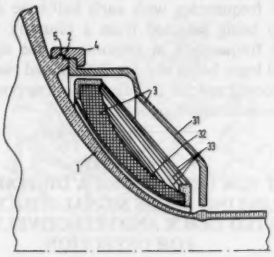
Wolfram Andre, Aichwald, and Walter Kornaker, Esslingen-Berkheim, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 6, 1977, Ser. No. 803,698

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2626114

Int. Cl.[2] H01J *29/76*

U.S. Cl. 358—248 8 Claims



1. An arrangement for mounting the deflection system of a color picture tube to an envelope thereof on the side facing the screen comprising:

a glass stop collar provided in said envelope, said stop collar having a stop surface against which said deflection system rests;

a plurality of connecting means carried by said stop collar; and

a cap engaging said connecting means and said deflection system to connect said deflection system to said envelope.

4,130,838

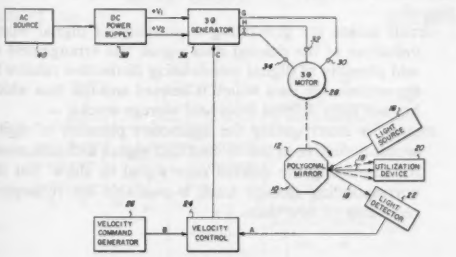
SPEED CONTROL APPARATUS FOR SCANNING SYSTEM

Robert P. St. John, Marina Del Rey, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 11, 1977, Ser. No. 823,812

Int. Cl.[2] H04N *1/36*

U.S. Cl. 358—267 18 Claims



1. Apparatus for controlling the rotational speed of a polygonal mirror adapted to scan a reflected light beam over a desired scanning area as each facet of the mirror is rotated into the path of an incident light beam, said apparatus comprising:

a poly-phase motor coupled to said mirror for driving same, said motor having a plurality of input terminals and a plurality of motor windings connected to said input terminals;

first means responsive to said reflected light beam for generating a first clock signal having a frequency proportional to the actual rotational speed of said mirror;

second means for generating a second clock signal having a frequency proportional to a desired rotational speed of said mirror;

third means coupled to said first and second means and responsive to said first and second clock signals for generating a third clock signal having a frequency representative of the difference in phase between said first and second clock signals; and

a poly-phase generator coupled to said third means and responsive to said third clock signal for generating a plurality of mutually phase-displaced drive signals for respective application to the plurality of input terminals of said motor, whereby a plurality of mutually phase-displaced sinusoidal signals are developed across said motor windings, each sinusoidal signal having a frequency proportional to the frequency of said third clock signal.

4,130,839

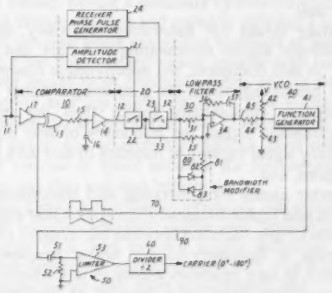
CIRCUITRY FOR A FACSIMILE RECEIVER FOR REGENERATION OF CARRIER FOR AN AMPLITUDE MODULATED SUPPRESSED CARRIER SIGNAL

Timothy L. McCullough, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sep. 12, 1977, Ser. No. 832,222

Int. Cl.[2] H04N *1/40*

U.S. Cl. 358—281 11 Claims



1. Circuitry for a facsimile receiver for regenerating a carrier signal from the full-wave rectified signal obtained from a received signal which includes an amplitude modulated suppressed carrier signal and periodic short intervals of unmodulated carrier, each short interval being synchronous with a position signal produced at the facsimile receiver each time the phase position of the receiver is reached, including:

a phase lock loop including a phase comparator having first and second inputs, said first input connected for receiving the full-wave rectified signal, a low-pass filter means, a VCO having an input operatively connected to the output of said filter means and output operatively connected to said second input of said comparator, said VCO having a free run frequency that is twice the frequency of the carrier signal;

switch means operatively connected to said facsimile machine for providing a time slot for each of the position signals and operatively connected for responding to the received signal for detecting periods of unmodulated carrier, said switch means connected to said phase lock loop for operatively connecting the output of said comparator to said filter means when one of the short intervals of unmodulated carrier is detected by said switching means during said time slot; and

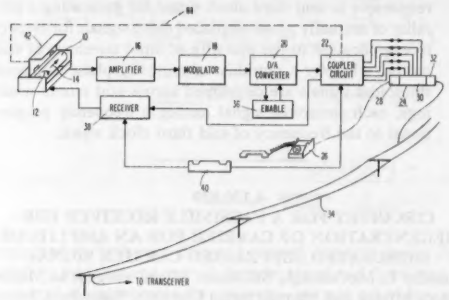
a divider operatively connected to the output of said VCO for providing a signal having a frequency that is one-half the frequency of the signal presented at the output of the VCO.

4,130,840

METHOD AND APPARATUS FOR COUPLING FACSIMILE SIGNALS TO A TELEPHONE NETWORK

John M. Vandling, Pleasantville, N.Y., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 21, 1977, Ser. No. 844,298
Int. Cl.[2] H04H *1/40*
U.S. Cl. 358—281 **15 Claims**



1. A facsimile transmitting apparatus for transmitting signals representing dark and light regions on a document, said apparatus comprising:

sensor means for sensing dark and light regions on the document; and

transmitting means for generating frequency modulated transmission signals representing said dark and light regions on said document, the improvement comprising:

signal generating means for generating a signal having a frequency substantially higher than the modulated transmission signal, the frequency of said higher frequency signal varying in response to said dark and light regions, and

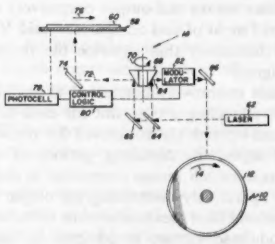
converter means for generating said transmission signal from said higher frequency signal such that a light/dark or dark/light variation between said regions produces a change in frequency of said higher frequency signal which in turn produces a change in frequency in said transmission signal in a fraction of the transmission signal cycle.

4,130,841

VARIABLE FREQUENCY HALF-TONE IMAGING APPARATUS

Arthur M. Walsh, Pittsford, and Frederick R. Ruckdeschel, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 7, 1977, Ser. No. 775,130
Int. Cl.[2] H04N *1/04, 1/22*
U.S. Cl. 358—298 **7 Claims**



1. An apparatus for reproducing an original document, including:

a laser arranged to transmit a beam therefrom;

means for splitting the beam into read and write beams;

means for moving the read beam across the original document;

means for detecting the intensity of the read beam transmitted from the original document and generating signals indicative of the tonal graduation of the original document;

control logic arranged to produce a plurality of signals having different frequencies witheach frequency corresponding to different pre-determined ranges of signals from said detecting means; and

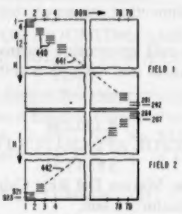
an electro-optical modulator, coupled to said control logic, for modulating the write beam to form an image of the original document having a plurality of half-tone dot spacial frequencies with each half-tone dot spacial frequency being selected from a plurality of pre-selected spacial frequencies in response to the signal from said control logic being in a pre-determined range, each of the pre-selected spacial frequencies corresponding to differing pre-determined signal ranges.

4,130,842

CIRCUIT FOR GENERATING A DIGITAL, DELETED DATA, BLINKING CROSS SIGNAL WHICH IS STORED IN A DELETED TRACK AND SELECTIVELY DISPLAYED FOR DETECTION

Luigi C. Gallo, Redwood City, and Junaid Sheikh, Palo Alto, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 762,903, Jan. 26, 1977, abandoned. This application Feb. 4, 1977, Ser. No. 765,564
Int. Cl.[2] H04N *5/78*; G06F *3/14*
U.S. Cl. 360—35 **8 Claims**



1. A circuit for generating and displaying a deleted data signal representative of tracks in a storage system from which undesirable data have been deleted, comprising the combination of;

circuit means for generating a plurality of digital words definitive of the deleted data signal, the arrangement of said plurality of digital words being distinctive relative to the undesirable data which is deleted and the data which has not been deleted from said storage tracks;

means for interrogating the distinctive plurality of digital words definitive of the deleted data signal; and new means for displaying the deleted data signal to show that the corresponding storage track is available for subsequent recording of new data.

4,130,843

RECORD INHIBIT DEFEAT IN A RECORDING AND REPRODUCING APPARATUS

Toshio Miyamoto, Tokyo, and Mutsuo Hoshido, Kashiwa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

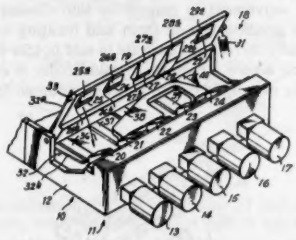
Continuation of Ser. No. 755,941, Dec. 30, 1976, abandoned. This application Apr. 4, 1977, Ser. No. 784,379
Claims priority, application Japan, Jan. 8, 1976, 51-1117
Int. Cl.[2] G11B *15/12, 15/04*
U.S. Cl. 360—62 **16 Claims**

1. A recording and/or reproducing apparatus comprising:

a push-button assembly including a forward push-button actuable from a rest position to an active position for

establishing a reproducing mode of operation of the apparatus, a record push-button actuable from a rest position to an active position for establishing a recording mode of operation of the apparatus upon disposition of said forward push-button in said active position of the latter, and a stop push-button actuable from a rest position to an active position for restoring the apparatus to a stop mode;

first interlocking means operative to prevent actuation of said record push-button to its active position after said forward push-button has been actuated to said active position of the latter and thereby normally inhibiting



change-over of the apparatus directly from its reproducing mode of operation to its recording mode of operation;

second interlocking means operative in response to establishing of said recording mode of operation to disable said first interlocking means and thereafter permit actuation of said record push-button to its active position with said forward push-button already in said active position of the latter; and

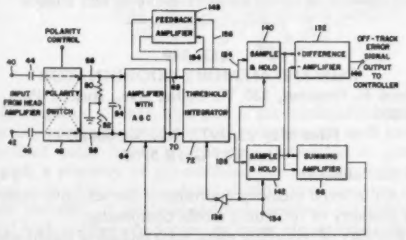
means responsive to the restoration of the apparatus to said stop mode thereof for disabling said second interlocking means.

4,130,844

METHOD AND MEANS FOR TRACKING MAGNETIC TRACKS

Lance T. Klinger, Playa Del Rey, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,852
Int. Cl.[2] G11B *21/10, 5/58*
U.S. Cl. 360—77 **12 Claims**



1. In a magnetic media tracking system of the type using dipulses of alternating polarity to produce an error indication through integration, the improvement comprising:

(a) means for partially integrating said dipulses to form a partially integrated signal;

(b) means for separately integrating only those positive and negative portions of said partially integrated signal whose absolute value exceeds a predetermined threshold; and

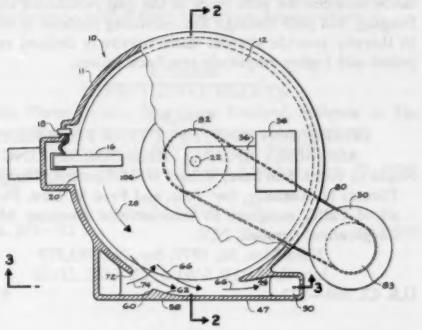
(c) means for subtractively combining said positive and negative portions to form said error indication.

4,130,845

DISC CABINET RECIRCULATING AIR FLOW SYSTEM

Clarence O. Kulma, Huntington Beach, Calif., assignor to Microdata Corporation, Irvine, Calif.

Filed Jul. 8, 1977, Ser. No. 813,942
Int. Cl.[2] G11B *23/02, 25/04, 17/26, 5/82*
U.S. Cl. 360—97 **20 Claims**



1. An air pressure control system for a cabinet for rotatable discs, comprising:

a disc cabinet having a generally cylindrical shaped interior wall defining an axis and partially defining a cabinet interior, the wall being adapted to surround at least one disc, and a top cover joined to said interior wall and a bottom cover joined to an opposite portion of said interior wall, wherein said top cover defines a first volume of space between the uppermost of said at least one disc and said top cover, and wherein said bottom cover defines a second volume of space between the lowermost of said at least one disc and said bottom cover;

rotating means for rotatably mounting and spinning said at least one disc coaxially within said cylindrically shaped interior wall, said rotating means including a rotating means opening in said cabinet through which opening said rotating means may enter said interior; and

air inlet means for admitting air from outside the cabinet into said interior, said air inlet means including an air inlet means opening positioned opposite said disc from said rotating means opening in said cabinet;

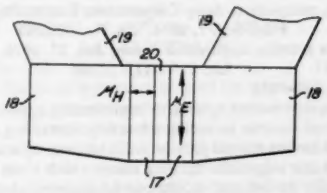
wherein the ratio of said first volume to said second volume is predetermined to maintain air pressure in said interior adjacent said rotating means opening, higher than ambient air pressure when said at least one disc is rotated.

4,130,846

MAGNETIC TRANSDUCER

Donald T. Best, Lafayette Hill, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,344
Int. Cl.[2] G11B *5/28*
U.S. Cl. 360—120 **7 Claims**



1. A magnetic read/record transducer structure having a

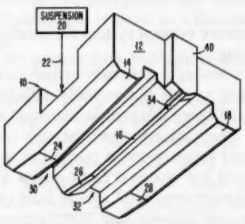
pair of poles with apposed pole faces spaced from one another by a separation layer which defines a single gap between said pole faces, each of said pole faces comprising a layer of uniaxially anistropic magnetic material characterized by low magnetic permeability in a first direction between the pole faces through the separation layer and characterized by substantially higher magnetic permeability in a direction orthogonal to said first direction, whereby the ratio of magnetic head gap reluctance between the pole faces to the gap reluctance along the fringing flux path through the recording medium is increased to thereby provide sharper more narrowly defined recorded pulses and higher amplitude readback pulses.

4,130,847

CORROSION RESISTANT THIN FILM HEAD ASSEMBLY AND METHOD FOR MAKING

Nephi L. Head, San Jose; Robert D. Hempstead, Morgan Hill; Thomas N. Kennedy, San Jose, and Fred Y. Lieu, Palo Alto, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,373
Int. Cl.[2] G11B *5/60, 5/12, 5/22, 21/20*
U.S. Cl. 360—122 **9 Claims**



1. A magnetic head assembly comprising:

a slider support having a bearing surface for close association with a magnetic media;

a transducer assembly including at least one film magnetic layer and at least one electrically conductive film layer together with means to activate each conductive layer and having an active face for a transducing action with a magnetic transition from the magnetic media in relative movement therewith, said transducer assembly fastened to said slider support adjacent to its bearing surface, said transducer assembly and a portion of the bearing surface of said slider support adjacent to said transducer assembly being recessed; and

a film layer of a passivation material covering the active face of said transducer assembly and the recess portion, said film layer being protected from excessive contact with the media by the unrecessed portion of the bearing surface of the slider support.

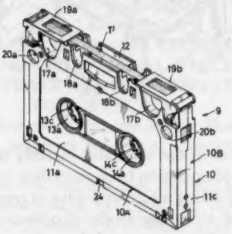
4,130,848

CASSETTE TAPE RECORDING AND/OR REPRODUCING APPARATUS

Kenichi Amano; Yutaka Suzuki, and Yoshio Kishi, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1976, Ser. No. 720,742
Claims priority, application Japan, Jan. 27, 1976, 51-7829
Int. Cl.[2] G11B *23/06*
U.S. Cl. 360—132 **9 Claims**

1. In a tape recording and/or reproducing apparatus for use with a tape cassette including a housing containing a supply of tape and having spaced parallel walls with an opening therebetween at one side of the housing along which a run of the tape is normally guided, and at least one lid mounted on the housing for movement relative to the latter in directions parallel to the planes of said spaced walls between a closed position where the lid extends along the opening for covering a respective part of said run of the tape and an opened position where the lid is displaced from said opening to permit the withdrawal of the tape therethrough; and in which said apparatus includes a chassis, transducer means mounted on said chassis for recording and/or reproducing information signals on a tape engaged therewith, locating means on said chassis engageable with the cassette housing for disposing the latter with said one side thereof facing toward and spaced from said transducer means, and tape withdrawing means engageable with said tape run in a cassette housing engaged with said locating means and being operative to withdraw the tape through said opening and into engagement with said transducer means: a cassette loading device comprising a cassette holder, means mounting said holder for movement in respect to said chassis between an inoperative position spaced from said locating means for the insertion and removal of a cassette in said holder and an operative position where a cassette in said holder is engaged with said locating means, lid opening means mounted for movement



in respect to said holder and said chassis between an inactive position at which said lid opening means is spaced from a cassette in said holder in a direction substantially perpendicular to said planes of the walls of the cassette housing so as to avoid interference with said insertion and removal of the cassette in said holder, and an active position at which said lid opening means is engageable with each said lid of a cassette in said holder and is displaced relative to said holder in the direction of movement of the respective lid from its closed position to its opened position, and cam means connecting said lid opening means with said holder and said chassis for disposing said lid opening means in said inactive and active positions upon the disposition of said holder in said inoperative and operative positions, respectively, said cam means being operative, in response to initial movement of said holder in the direction away from said inoperative position, to move said lid opening means relative to said chassis in a direction opposed to said initial movement of the holder relative to said chassis.

4,130,849

INDEXED MEMORY COORDINATOR

Millard F. Freehauf, 135 W. Colfax Ave., Roselle Park, N.J. 07204

Filed May 25, 1977, Ser. No. 800,559
Int. Cl.[2] G11B *5/00*
U.S. Cl. 360—137 **1 Claim**

1. An indexed memory coordinator for selective recording on a plurality of recording media comprising:

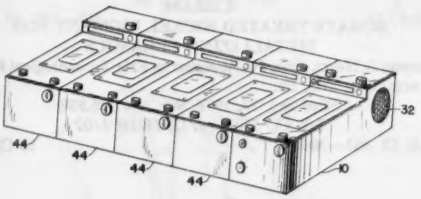
a plurality of recording units, each including means adapted to receive one of said audio recording media and each further including means responsive to recording signals applied thereto for storing information on said one recording medium, and means for reading information stored on said recording medium to generate information signals, and means for actuating said reading means;

a microphone for converting sound to audio signals;

means responsive to said audio signals applied thereto for generating said recording signals, said recording signal generating means being incorporated in a master unit which includes means for converting said information

signals into audible signals, and each of said plurality of recording units being incorporated in a respective one of a plurality of slave units;

switching means operable to couple said microphone to said recording signal generating means and to selectively apply said recording signals to a selected one of said plurality of recording units, said switching means including common bus means for interconnecting said master unit and said plurality of slave units, and further including a plurality of switch units each coupled between said common bus means and a respective one of said plurality of slave units, wherein each of said switch units includes a switch selectively operable to a first state, a second state, and a third state, said switch in said first state applying said recording signals to the corresponding one of said storing means, said switch in said second state applying information signals from the corresponding reading means to said converting means, said switch being arranged to return to said third state when not operated to said first or second state so as to disconnect the associated recording unit from the common bus means when in said third state.

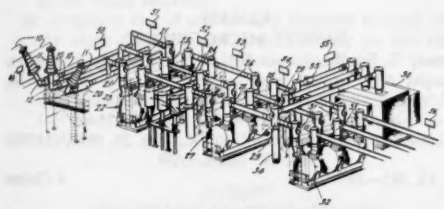


4,130,850

HIGH SPEED FAULT DIVERTER SWITCH FOR GAS-INSULATED SYSTEMS

John C. Cronin, and Willy Schuetz, both of Greensburg, Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 12, 1977, Ser. No. 758,635
Int. Cl.² H02H 7/22
U.S. Cl. 361—54 **7 Claims**



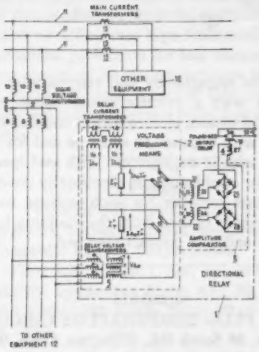
1. In a high a-c voltage, high-power gas-insulated substation, a plurality of gas-insulated electrical components each having a gas-filled outer conductive housing connected to ground potential; a plurality of gas-insulated bus members interconnecting each of said gas-insulated electrical components; each of said plurality of gas-insulated bus members comprising a central high-voltage conductor, an outer elongated grounded housing filled with a dielectric gas, and spaced insulation supports for supporting said central conductor within said outer housing; a high speed diverter switch connected to at least one of said plurality of gas-insulated bus members for connecting said central conductor to said outer grounded housing in less than one cycle of said outer grounded having the capability of closing on a fault current and reopening when said fault current is cleared; a high speed operating mechanism for operating said diverter switch in response to an operating signal; and fault signal detector means connected in at least given ones of said plurality of bus members for detecting an arc from said central conductor to said grounded housing within said given bus members and providing an output signal; said fault signal detector means connected to said operating mechanism; said output signals from each of said fault signal detector means comprising said operating signal for said operating mechanism, whereby said high speed diverter switch closes to short said central conductor to ground within less than about one cycle in response to the detection of arcing within said substation; each of said fault signal detector means being responsive to pressure increase within their respective bus members.

4,130,851

DIRECTIONAL RELAYS

Leonardo Perez-Cavero, Haughton, England, assignor to The General Electric Company Limited, London, England

Filed Jul. 19, 1976, Ser. No. 706,515
Claims priority, application United Kingdom, Jul. 22, 1975, 30603/75
Int. Cl.² H02H 3/26
U.S. Cl. 361—82 **9 Claims**



1. A directional relay for a polyphase electric power transmission system comprising: means for producing first and second voltages which are respectively of the form $V_A \mp I_A Z_r'$ and $V_A \mp I_A Z_r''$ where V_A is a voltage component of the system at the relaying point; I_A is the corresponding current at the relaying point; and Z_r' and Z_r'' are impedances having values such that said first and second voltage simulate said voltage component at different points so that the amplitude difference of said first and second voltages under fault conditions corresponds in sense to the sense of the variation of said voltage component from point to point along the system between the relaying point and the fault point in a given direction along the system; and amplitude comparator means for producing an output indicative of the sense of the amplitude difference of said first and second voltages.

4,130,852

GROUNDED GRID STATIC DISCHARGE APPARATUS

Robert M. Peffer, Penfield; Albert H. Rehn, Rochester, and Zacharie Grose, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,171
Int. Cl.² H05F 3/04
U.S. Cl. 361—213 **11 Claims**

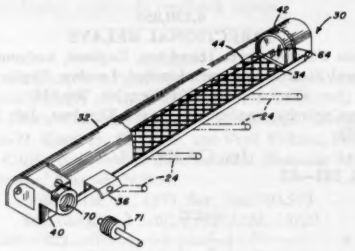
1. Static discharge apparatus adapted for use with a voltage source for eliminating static charge on a web moving along a travel path, said apparatus comprising;

a corona wire spaced from and extending transverse to said travel path, said corona wire producing a charged ion cloud when coupled to a voltage source;

grounded grid means, positioned between said corona wire and said travel path, for attracting the ions in said charged ion cloud and defining openings through which said ions

pass when attracted by the static charges on such web as the web moves along said travel path adjacent to said grounded grid means; and

means for accurately positioning said corona wire relative to said grounded grid means and electrically coupling such voltage source to said corona wire with a minimum of electrical interfaces, said positioning and coupling means comprising a contact member electrically coupled to and physically supporting one end of said corona wire, means



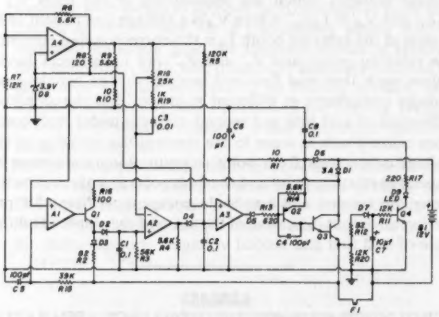
adapted to be engaged by said corona wire for spacing said corona wire a predetermined distance from said grounded grid means, tension means coupled to the end of said corona wire opposed to said one end for maintaining said corona wire in engagement with said spacing means, and means for establishing an electrically conductive path to said contact member for such voltage source which path is physically spaced from the coupling between said corona wire and said contact member.

4,130,853

GLOW PLUG TEMPERATURE CIRCUIT

Roxton E. Baker, 56 South Rd., Ellington, Conn. 06029

Filed Feb. 25, 1977, Ser. No. 771,331
Int. Cl.² F23Q *7/00*
U.S. Cl. 361—264 **2 Claims**



1. In combination with a circuit for applying power to a glow-plug filament having a positive temperature coefficient of resistance, the power being applied for time periods dependent on a temperature signal appearing at an input terminal of the power-applying circuit, a glow-plug temperature circuit, comprising:

a. a resistor circuit in series with the filament, thereby forming a filament-current path; and

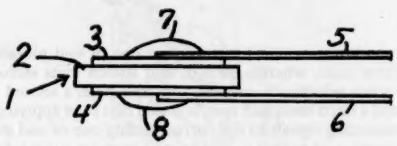
b. means for applying an output voltage across the path sufficient to maintain a predetermined voltage across the filament, the output voltage also being applied to the input terminal of the power-applying circuit, the output voltage thereby being the temperature signal, which increases as the filament resistance decreases and decreases as the filament resistance increases, thus exhibiting an inverse relationship to temperature.

4,130,854

BORATE TREATED NICKEL PIGMENT FOR METALLIZING CERAMICS

Jerome J. Hertz, Erie, Pa., assignor to Erie Technological Products, Inc., Erie, Pa.

Filed Sep. 23, 1976, Ser. No. 725,958
Int. Cl.² H01G *4/12*; H01B *1/02*
U.S. Cl. 361—304 **12 Claims**



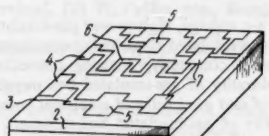
1. A metallization of finely divided non-noble metal(s) useful in conductor formation, comprising pigment sized particles of nickel which has been treated to remove its surface oxide coating and to replace the same with an oxidation resistant borate coating.

4,130,855

PASSIVE MICROCIRCUIT

Gennady G. Smolko, korpus 501, kv. 19; Gennady F. Vasiliev, korpus 331, kv. 93, both of Moscow, and Nordari M. Chikovani, ulitsa Krylova, 10, Tbilisi, all of U.S.S.R.

Filed Mar. 5, 1976, Ser. No. 664,171
Claims priority, application U.S.S.R., Mar. 25, 1975, 2112851
Int. Cl.² H05K *7/20*
U.S. Cl. 361—387 **6 Claims**



1. A passive microcircuit comprising: a metal substrate; a dielectric layer formed upon said metal substrate; current-carrying tracks, pads, capacitor electrodes and resistors, all being components of said passive microcircuit and arranged on said dielectric layer, all components and the dielectric layer being at least partially formed from the same material of said metal substrate, to closely match the temperature coefficients of expansion of the components, layer and substrate.

4,130,856

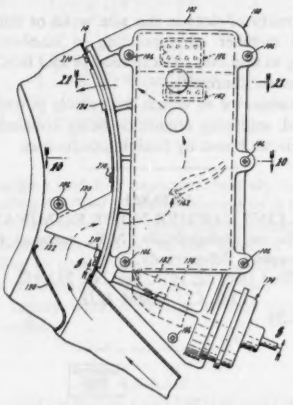
HOUSING FOR MOUNTING ELECTRONIC CIRCUIT BOARDS ON AN ENGINE AIR FILTER HOUSING

Frederick W. Crall, Farmington, and Lawrence W. Tomczak, Sterling Heights, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 659,297, Feb. 19, 1976, Pat. No. 4,050,093, which is a division of Ser. No. 587,193, Jun. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 570,540, Apr. 22, 1975, abandoned. This application May 23, 1977, Ser. No. 799,413

Int. Cl.[2] H05K *7/02*

U.S. Cl. 361—415 12 Claims



1. A circuit board housing in combination with a pair of electronic circuit board assemblies comprising:

first and second housing elements detachably secured together to form said housing;

each of said housing elements comprising a circuit-board-assembly receiving pocket interior of the housing;

each one of said electronic circuit board assemblies being disposed in a corresponding one of said pockets;

an electrical connector plug assembly on each electronic circuit board assembly;

an opening in one of said housing elements through which the electrical connector plug assembly on the circuit board assembly disposed therein extends;

and a second opening in said one housing element through which the electrical connector plug assembly on the circuit board assembly disposed in the other housing element extends.

4,130,857

MULTILAMP PHOTOFLASH UNIT

Boyd G. Brower, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 8, 1977, Ser. No. 785,987

Int. Cl.[2] G03B *15/02*

U.S. Cl. 362—10 11 Claims

1. A multilamp photoflash unit comprising, in combination:

a printed circuit board having circuitry on a surface thereof;

a plurality of flashlamps positioned over said surface and having lead-in wires connected to said circuitry, said circuitry being provided for sequentially igniting said flashlamps;

a plurality of electrically conductive reflectors respectively associated with said flashlamps and positioned between said lamps and said circuit board, at least a subplurality of said reflectors each having aperture means therein;

a respective subplurality of radiant-energy-activated disconnect switches attached to said circuit board in alignment respectively with the aperture means in said reflectors, each of said disconnect switches being electrically connected to said circuitry in series with a respective one of said flashlamps for interrupting the igniting circuit for said flashlamp after said flashlamp is ignited, and each of said disconnect switches comprising an electrically conductive strip of fusible material attached at both ends to said circuit board with the midportion of said strip being positioned so as to be in operative relationship with the radiant output of a respective ignited flashlamp via the aperture means in a respective reflector; and

a respective subplurality of radiant-energy-activated connect switches disposed on said circuit board in alignment respectively with the aperture means in said reflectors, each of said connect switches being electrically connected to said circuitry in series with a respective one of said flashlamps for establishing the igniting circuit for said flashlamp after ignition of the preceding flashlamp in the igniting sequence, and each of said connect switches comprising a mass of high resistance material convertible to a conductive state upon being activated by radiant energy;

wherein the improvement comprises said high resistance material being further disposed on and about each of said ends of the conductive strips of material comprising said disconnect switches, said high resistance material providing mechanical protection for said disconnect switch strip ends and electrical insulation between the circuitry connected to and located adjacent said disconnect switch strip ends and said conductive reflectors and/or proximate circuitry.

4,130,858

LAMP-MOVING DEVICE

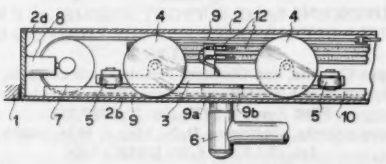
Yoshito Hayakawa, Kohnosu, Japan, assignor to Yamada Iryo Shomei Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1977, Ser. No. 787,257

Claims priority, application Japan, Apr. 30, 1976, 51/53278

Int. Cl.[2] F21S *1/02;* E01B *25/22;* F21S *1/04, 3/02*

U.S. Cl. 362—150 8 Claims



1. A lamp-moving device for moving a lamp mounted in a ceiling across the ceiling, said device comprising:

rail means embedded in said ceiling, flush therewith, and having a longitudinal opening therein flush with said ceiling;

lamp support means within and extending downward from said rail means through said opening for supporting and moving said lamp within said rail means; and

belt means surrounding and movable with said lamp support means within said rail means and positioned over said opening for sealing said opening.

4,130,859

POCKET LAMP

Alain Battarel, St. Aubin les Elbeuf, France, assignor to Compagnie Industrielle des Piles Electriques "Cipel" S.A., Levallois-Perret, France

Filed Nov. 23, 1976, Ser. No. 744,302

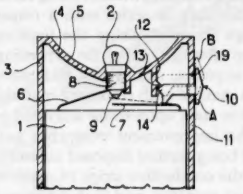
Claims priority, application France, Nov. 28, 1975, 75 36561

Int. Cl.[2] F21L *7/00*

U.S. Cl. 362—205 9 Claims

1. An electric pocket lamp including an elongated molded plastic battery housing having a surrounding wall at one end

thereof and an integrally molded concave plastic reflector supported by the wall and closing said one end of the housing, a light bulb centrally mounted in the reflector and having two terminals, an electric battery means positioned in the housing, the battery means having a resilient blade permanently attached to each of positive and negative poles thereof, the blades extending from the battery at the one end of the housing such that one resilient blade is biased into direct contact with one terminal of the light bulb, the wall of said housing having an elongated slot adjacent said one end, and a molded plastic slider means having a thumb-actuated knob in sliding contact with the exterior surface of said wall and a portion extending



through said slot to the interior of the housing, the slider means being reciprocally movable in said slot and said interior portion of the slider means being operatively engageable with the other resilient blade for selectively opening and closing an electrical circuit between the other blade and the other terminal of the light bulb in response to reciprocal movement of the slider means in the slot, wherein the improvement comprises:

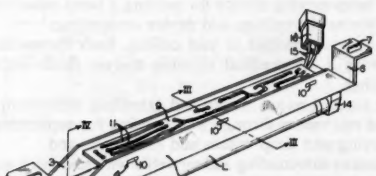
a resilient plastic appendage molded integrally with the housing and extending from the interior surface thereof in the vicinity of the slot in said wall and cooperating with the slider means to determine two positive detent positions for the slider means corresponding to the opening and closing of said electrical circuit.

4,130,860

FLUORESCENT LAMP SUPPORT ASSEMBLAGE WITH BUILT-IN CONVERTER FOR THE LIGHTING OF VEHICLES

Giuseppe Careglio, and Giovanni Proietti, both of Turin, Italy, assignors to WABCO Westinghouse, Turin, Italy

Filed Apr. 14, 1977, Ser. No. 787,733
Claims priority, application Italy, May 4, 1976, 68086 A/76
Int. Cl.[2] F21S *3/00*; H01R *33/08*
U.S. Cl. 362—217 **4 Claims**



1. A fluorescent lamp support assemblage including a built-in converter for rendering a vehicle power supply suitable for lighting of fluorescent lamps, wherein the support assemblage comprises:

(a) a channel-shaped member formed of sheet metal and having integral end brackets adapted to receive a fastener to secure said channel-shaped member to a supporting framework of the vehicle;

(b) a printed circuit board on which is pre-mounted the electrical components forming the converter, said circuit board being fastened to the side walls of said channel-shaped member;

(c) a pair of fluorescent lamp holders electrically connected to said printed circuit board by flexible conductors, said lamp holders being fastened to the base of said channel-shaped member at opposite ends thereof for receiving a fluorescent lamp;

(d) snap insertion means for providing said fastening of said printed circuit board and said lamp holders to said channel-shaped member comprising:

(i) a plurality of tabs along two opposite edges of said printed circuit board and extending laterally therefrom; and

(ii) a plurality of slots in the side walls of said channel-shaped member corresponding in number, size and spacing to said tabs so as to receive said tabs in locking engagement therewith.

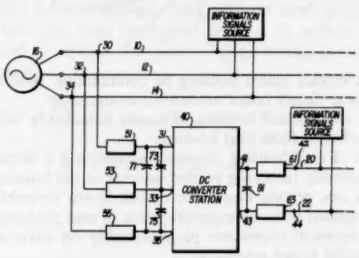
(e) a plug connector to which the vehicle power supply is connected, said plug connector being connected to said printed circuit board by flexible conductors.

4,130,861

POWER LINE CARRIER NOISE ELIMINATION

James J. LaForest, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1976, Ser. No. 752,932
Int. Cl.[2] H02M *1/12*
U.S. Cl. 363—39 **8 Claims**



1. In a power line carrier system for transmitting information signals on power transmission lines and including wires joining a noise source to the lines, a method for eliminating noise signals placed on the lines by the source, said method comprising the steps of:

(a) applying the information signals to the lines in a line-to-line mode to minimize attenuation thereof during transmission; and

(b) introducing capacitive impedance between each wire and every other wire to closely couple the noise signals placed on the individual lines so that they are of substantially equal magnitude and in phase and are placed on the lines in a line-to-ground mode to maximize attenuation thereof during transmission.

4,130,862

DC POWER SUPPLY

Frederick R. Holt, Saratoga, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Feb. 1, 1978, Ser. No. 874,124
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—49 **11 Claims**

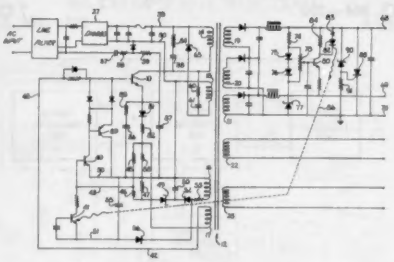
1. A direct current power supply comprising:

a transformer having at least one primary winding and one secondary winding, one lead of said primary winding for coupling to a source of direct current;

a transistor having a collector, base, and emitter terminal,

said collector terminal coupled to the other lead of said primary winding;

starting means for initiating oscillations such that power may be transferred through said transformer from said primary winding to said secondary winding, said starting means comprising a first resistor and first capacitor coupled to the emitter terminal of said transistor and charging means



for charging said first capacitor, said starting circuit for controlling the flow of emitter current so as to initiate said oscillations without damaging said transistor;

rectification means coupled to said secondary winding for providing an output direct current potential;

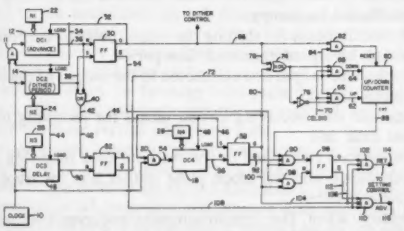
whereby oscillations are initiated in said direct current power supply without damage to said supply during a fault condition.

4,130,863

OPTIMIZING CONTROL SYSTEM

Paul H. Schweitzer, and Thomas W. Collins, both of State College, Pa., assignors to Optimizer Control Corp., Burnsville, Minn.

Filed Oct. 27, 1977, Ser. No. 845,804
Int. Cl.[2] G05B *13/02*; G06F *15/46*
U.S. Cl. 364—105 **9 Claims**



1. In an electronic control system for optimizing the performance of an energy consuming device of the type including means for perturbating a device control parameter with respect to a given setting, pulse producing means for generating pulses at a rate proportional to the instantaneous output of the device, correlator means for detecting the effect of said perturbating on said pulse rate and means responsive to said correlator means for producing control signals for adjusting said given setting in a direction to enhance the performance of the energy consuming device, the improvement comprising:

(a) a first decrementable digital counter connected to receive an initial value corresponding to a predetermined time segment of a device setting perturbating cycle;

(b) a second decrementable digital counter connected to receive an initial value corresponding to the complete device setting perturbating cycle time;

(c) a clock source of regularly occurring timing pulses connected to said first and second decrementable counters for decrementing said first and second decrementable counters at a fixed rate;

(d) an up/down digital counter; and

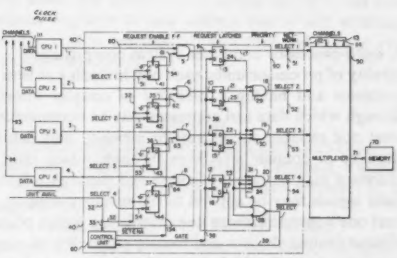
(e) logic circuit means coupling said up/down counter, to said pulse producing means and to said first and second decrementable counters for accumulating the algebraic difference in the number of pulses from said pulse producing means occurring during predetermined segments of said device setting perturbating cycle.

4,130,864

PRIORITY SELECTION CIRCUIT FOR MULTIPORTED CENTRAL FUNCTIONAL UNIT WITH AUTOMATIC PRIORITY REDUCTION ON EXCESSIVE PORT REQUEST

John C. Schlotterer, Casselberry, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 29, 1976, Ser. No. 736,798
Int. Cl.[2] G06F *3/04, 9/18*
U.S. Cl. 364—200 **5 Claims**



1. In a data processing system having a central functional unit; a plurality of data handling units; a like plurality of sources of request signals associated with the respective said data handling units for requesting data access with said central functional unit; a like plurality of communication channels between said central functional unit and the respective said data handling units; and a priority selector for outputting select signals corresponding to request signals in a predetermined priority order, each of said communication channels being operative to provide data access when controlled by a corresponding outputted select signal; the combination of:

a like plurality of gating means operative in response to a request signal to provide a gated signal when enabled;

a like plurality of means for enabling said gating means, respectively, in response to a common availability signal generated by said central functional unit after each completion of an arbitration process by said priority selector; and

a like plurality of means having a set and a reset position being provided for disabling in the set position a corresponding said enabling means when a corresponding select signal has been outputted by said priority selector;

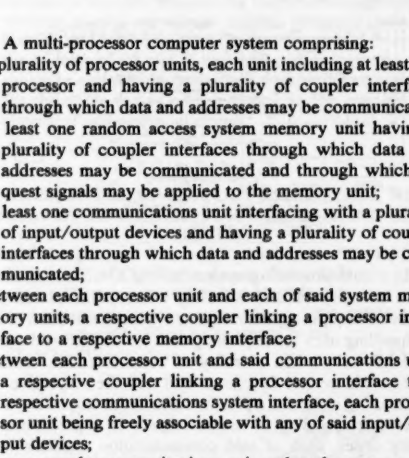
whereby following at least one first request signal served by said priority selector in the presence of gating means having no request signal, an availability signal outputted by said central functional unit causes operation of said priority selector in relation to new request signals before any renewed such first request signal.

4,130,865

MULTIPROCESSOR COMPUTER APPARATUS EMPLOYING DISTRIBUTED COMMUNICATIONS PATHS AND A PASSIVE TASK REGISTER

Frank E. Heart, Lincoln; Severo M. Ornstein, Waban; William B. Barker, Maynard, and William R. Crowther, Arlington, all of Mass., assignors to Bolt Beranek and Newman Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 476,546, Jun. 5, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,131
Int. Cl.[2] G06F *9/18, 15/16*
U.S. Cl. 364—200 7 Claims



1. A multi-processor computer system comprising:

a plurality of processor units, each unit including at least one processor and having a plurality of coupler interfaces through which data and addresses may be communicated;

at least one random access system memory unit having a plurality of coupler interfaces through which data and addresses may be communicated and through which request signals may be applied to the memory unit;

at least one communications unit interfacing with a plurality of input/output devices and having a plurality of coupler interfaces through which data and addresses may be communicated;

between each processor unit and each of said system memory units, a respective coupler linking a processor interface to a respective memory interface;

between each processor unit and said communications unit, a respective coupler linking a processor interface to a respective communications system interface, each processor unit being freely associable with any of said input/output devices;

between each communications unit and each system memory unit, a respective coupler linking a communications interface to a respective memory interface, said couplers providing a distributed switching network permitting data communication between any pair of said processors, system memory, and communication units; and

at least one addressable, passive task register associated with one of said units for communication through said couplers for registering a variety of task requests, each task request having a corresponding task priority value which is registered with the request, input/output devices operating to directly register corresponding task requests and values, said register being readable by any one of said processors to obtain the highest priority value registered,

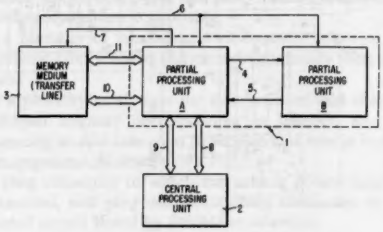
whereby a system program incorporating instruction sequences of preselectable length interspersed with instructions effecting reading of said task register will be run by said multi-processor computer system using all available processor units.

4,130,866

DATA PROCESSOR HAVING A CIRCUIT STRUCTURE SUITABLE FOR FABRICATION IN LSI FORM

Masahiko Ono, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1977, Ser. No. 788,935
Claims priority, application Japan, Apr. 19, 1976, 51-44257
Int. Cl.[2] G06F *1/04*
U.S. Cl. 364—200 7 Claims



1. A data processor comprising:

(a) a first partial processing unit having an arithmetic-logic unit (ALU) for processing data, storage means connected to the arithmetic logic unit for storing instruction words to control the operation of the arithmetic-logic unit, a group of register means connected to the arithmetic logic unit for effecting temporary memorization of data, a control signal register connected to the storage means for storing a synchronization/non-synchronization control signal, and timing pulse generating means for generating a plurality of pulses to drive the first partial processing unit, the first partial processing unit being formed on one semiconductor chip,

(b) a second partial processing unit including clock pulse generating means for forming a clock pulse of controllable frequency, said second partial processing unit comprising,

an oscillator,

a divider circuit connected to the oscillator for dividing the oscillation frequency,

shift circuit means for shifting the output pulse of the divider circuit by a predetermined time period,

a clock pulse output line connected to the output of the shift circuit means,

a read-out data receiving circuit means for receiving read-out data; and

a trap circuit connected to the read-out data receiving circuit means and the clock pulse output line for trapping read-out data,

whereby when the synchronization/non-synchronization indication (SYN) signal is applied to the second partial processing unit, if the SYN signal is "0" state, the output clock pulse is produced by the divider circuit and the shift circuit means independently of the read-out data, and if the SYN signal is "1" state, the trap circuit traps the read-out data in "1" state of the clock pulse and after that keeps the pulse in a "1" state during said predetermined time;

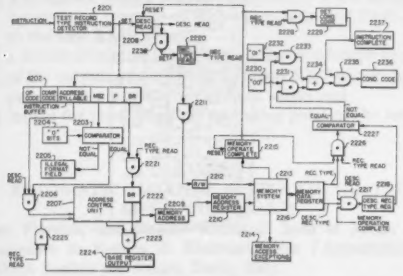
(c) a clock signal line for sending out the clock pulse from the second partial processing unit to the timing pulse generating means in the first partial processing unit,

(d) a control line connecting the first partial processing unit with the second partial processing unit for sending out the synchronization/non-synchronization control signal from the control signal register of the first partial processing unit to the clock pulse generating means of the second partial processing unit to change the frequency of the clock pulse, the plurality of pulses in the first partial processing unit being produced by the timing pulse generating circuit in response to the clock pulse applied from the second partial processing unit as a pulse source.

4,130,867
DATABASE INSTRUCTION APPARATUS FOR DETERMINING A DATABASE RECORD TYPE

Charles W. Bachman, Lexington, and Benjamin S. Franklin, Cambridge, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jun. 19, 1975, Ser. No. 588,523
Int. Cl.[2] G06F *9/14, 9/20, 13/00*
U.S. Cl. 364—200 8 Claims



1. In an internally programmed data processing apparatus having a main memory comprised of a plurality of segments of addressable space each segment having a segment number, each of said segments delineated by upper and lower variable bounds, with predetermined ones of said segments storing a plurality of files of database records grouped in sets of database records, each set of database records having at least one owner record and at least one member record, each of said owner and member records in said database record set being associated with one each of a record descriptor for describing said associated record, said record descriptors being stored in predetermined others of said segments; said data processing apparatus also having an arithmetic and logic unit (ALU) for performing arithmetic and logic operations on any data or address of said segments, records or descriptors; instruction hardware responsive to a test-record-type instruction for determining that the database record addressed in main memory is of the type described by its associated record descriptor, said instruction hardware comprising:

(a) first means for fetching from main memory said database record addressed into said arithmetic and logic unit;

(b) second means for fetching from main memory and into said arithmetic and logic unit the associated descriptor of said database record addressed; and,

(c) comparator means in said second means for comparing the type of said database record fetched into said ALU with a type of database record described in said associated descriptor; whereby if a miscompare does not result the database record is of the type described by its associated record descriptor.

4,130,868
INDEPENDENTLY CONTROLLABLE MULTIPLE ADDRESS REGISTERS FOR A DATA PROCESSOR

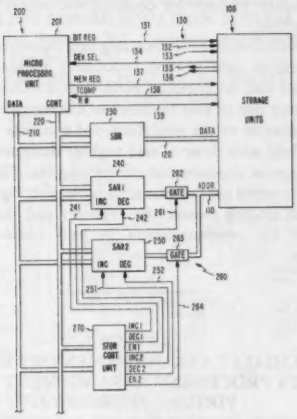
Dale A. Heuer; Charles W. McCallister, both of Stewartville, and Phillip C. Schloss, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,921
Int. Cl.[2] G06F *9/20*
U.S. Cl. 364—200 4 Claims

1. In a digital date processor having an addressable storage unit including an address bus and having a number of registers coupled to a common bus for transfer of data to and from said common bus, said processor being capable of producing command signals evoking the execution of different instructions, the combination comprising:

a storage control unit coupled to said common bus and responsive to one of said command signals for receiving a control word from said common bus, and for producing therefrom a plurality of control signals including first and second enable signals and mutually independent first and second address-modification signals;

first and second address registers coupled to said common bus and capable of being independently incremented and decremented by said first and second address-modification signals, respectively; and

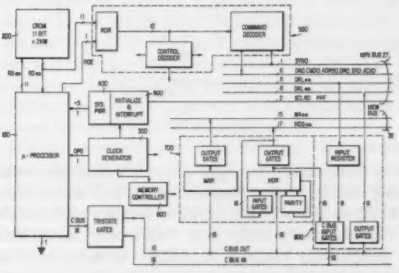


gating means for selectively coupling said first and second address registers to said address bus of said addressable storage unit in response to said first and second enable signals, respectively.

4,130,869
MICROPROGRAM CONTROLLED SYSTEM

Tsuneo Kinoshita, Kokubunji, and Isamu Yamazaki, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1977, Ser. No. 779,561
Claims priority, application Japan, Mar. 26, 1976, 51-33184
Int. Cl.[2] G06F *9/16*
U.S. Cl. 364—200 28 Claims



1. A microprogram-controlled system comprising:

(1) control storage means for storing microinstructions which includes an operation code field, an extension field and a register designation field in the format thereof, and

(2) central processing means including;

(a) microinstruction fetch control means for storing a next microinstruction address and data fetched from said control storage means;

(b) arithmetic and logic means for executing parallel add and subtract operations, logical operations and shift operations in response to said microinstructions,

(c) means for storing the output of said arithmetic and logic means,

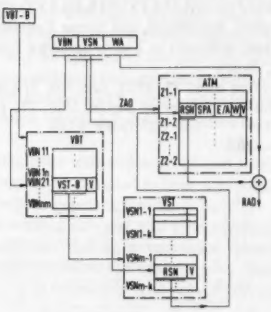
(d) an instruction register for storing macroinstructions,
(e) general registers designated by said macroinstructions and indirectly designated by said microinstructions,
(f) working registers utilized by said microinstructions,
(g) a flag register for storing information on a carry, a borrow and a sign as a result of operations carried out in said central processing means,
(h) a counter register for counting the number of said shift operations,
(i) a control decoder for decoding said microinstructions and controlling said central processing means in order to execute said microinstructions, which includes means for selecting one of said registers as a designation register by combination of the predetermined contents of said extension field with those of said register designation field, and
(j) an internal common bus connecting the microinstruction fetch control means, the arithmetic and logic means, the output storing means, the registers and the control decoder for communication in said central processing means.

4,130,870

HIERARCHIALLY ARRANGED MEMORY SYSTEM FOR A DATA PROCESSING ARRANGEMENT HAVING VIRTUAL ADDRESSING

Peter Schneider, Poecking, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 12, 1977, Ser. No. 832,237
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641722
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **10 Claims**



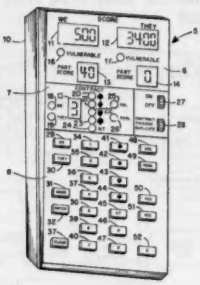
1. A hierarchially arranged memory system for a data processing system, with virtual addressing and which comprises:
a multi-level working memory including a main memory and a low capacity buffer store with a short access time;
a peripherally assigned secondary memory as a backing memory;
said main memory having a storage capacity sufficient to store the actual storage areas of all processes which are simultaneously processed in a multi-program operation;
a secondary buffer connected between said buffer store and said main memory for storing the actual storage areas of an active process and its successor process along with storage-resident system functions in one processing period; and
a microprocessor connected to said secondary buffer and to said main memory, said microprocessor triggered by the operating system of the data processing system to control the transfer of program data between said main memory and said secondary buffer in process alternations.

4,130,871

BRIDGE GAME SCORING AND DISPLAY COMPUTER

James R. Olsen, Shawsheen Rd., Bedford, Mass. 01730, and Charles R. Forth, S. Mission St., La Habra, Calif. 90631

Filed Oct. 17, 1977, Ser. No. 842,741
Int. Cl.[2] A63B *71/06*
U.S. Cl. 364—411 **17 Claims**



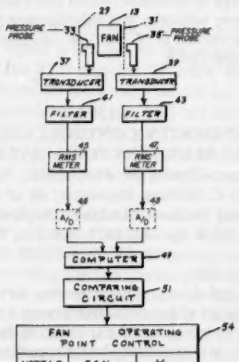
1. An electrical computer for computing the score of at least one of the parties engaged in the card game called Bridge, or the like, in which a hand of the game is dealt to the parties, bid upon by the parties, and played by the parties, each party taking tricks during the play, comprising,
(a) manually operated means for initiating the storage of electrical signals representative of the winning bid before the hand is played by the parties,
(b) manually operated means for initiating the production of electrical signals representative of the tricks taken during the play by the party winning the bid and
(c) means responsive to all of said signals for computing the change in the score of the party winning the hand.

4,130,872

METHOD AND SYSTEM OF CONTROLLING A JET ENGINE FOR AVOIDING ENGINE SURGE

Gary J. Harloff, Irving, Tex., assignor to the United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 10, 1975, Ser. No. 621,326
Int. Cl.[2] G01M *15/00*
U.S. Cl. 364—431 **7 Claims**



1. A system for automatically avoiding a surge of a jet engine having a fan with an entry plane and a discharge plane, comprising:

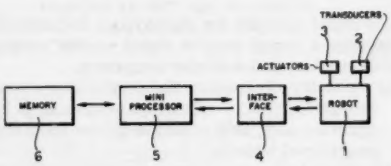
a. a first time variant total pressure probe positioned at the entry plane of the jet engine fan;
b. a second time variant total pressure probe positioned at the discharge plane of the jet engine fan;
c. first and second means for converting responses of the first and second pressure probes respectively into corresponding electrical signals;
d. first and second RMS meters fed respectively by the first and second converting means;
e. a computer fed by the first and second RMS meters for determining the ratio of the outputs of second RMS meter to the first RMS meter;
f. a threshold circuit fed by the computer wherein the ratio of the outputs of the first and second RMS meters is compared with a predetermined limit value; and
g. means for controlling the operating point of the fan.

4,130,873

AUTOMATIC MACHINE WITH ARTICULATED MECHANICAL ARM

Piero Fioretta, and Claudio Richiardi, both of Turin, Italy, assignors to Societa di Elettronica per l'Automazione — SEPA Societa per Azioni, Turin, Italy

Filed Dec. 3, 1975, Ser. No. 637,436
Claims priority, application Italy, Dec. 20, 1974, 70716 A/74
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—513 **4 Claims**



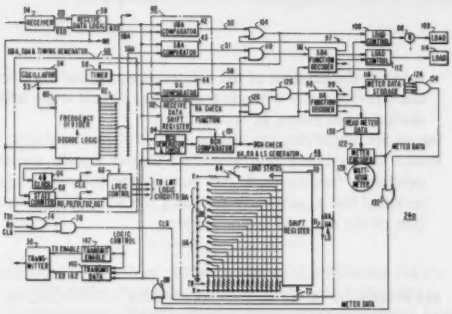
1. In a control system for an automatic machine of the type having:
an articulated mechanical arm movable with several degrees of freedom whereby its free end can describe any selected spatial path,
position transducer means connected to said arm and sensitive to the position of the arm so as to be operable to produce output signals representing the position of said arm,
a first memory for storing data representing the output signals from said transducer means resulting from the movement of the arm, said data being sequential numerical data representing the spatial coordinates as a timed sequence of points constituting the path followed by the arm, and
actuator means controllable by signals from said first memory to reproduce the movement of said arm memorized therein, said data stored in said first memory being recorded therein in a first operating phase of said machine during which an operator moves said arm through a required movement and the output signals from said position transducers are stored in said first memory as sequential numerical data;
the improvement wherein there are further provided:
processing means for processing said data memorized in said first memory following the manual handling of the said arm, said processing means operating to generate modified sequential numerical data representing the spatial coordinates of the significant points as a function of time of a movement which approximates said movement of said arm through which it is moved by said operator in said first operating phase,
a second memory for memorizing said modified sequential numerical data, and
means deriving control signals from said modified sequential data stored in said second memory and for applying said control signals to said actuator means to cause said arm to move through said approximation movement.

4,130,874

LOAD MANAGEMENT TERMINAL HAVING PLURAL SELECTABLE ADDRESS FORMATS FOR A POWER LINE COMMUNICATION SYSTEM

Stephen M. Pai, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 13, 1977, Ser. No. 806,252
Int. Cl.[2] H04Q *9/00*
U.S. Cl. 364—514 **19 Claims**



1. An addressable communication terminal for each of a plurality of remote locations linked to a central station by a communication system transmitting communication signals including binary coded data word messages having different binary address signals for selectively communicating with different ones of the remote locations, said addressable communication terminal comprising:
communication receiver means for receiving said communication signals including said binary coded data word messages including predetermined binary address signals designating a predetermined one of said remote locations;
internal address generator means including an output, a source of plural bit streams having different binary coded formats, and said address generator means further including connector means selectively connecting one of the bit streams to said output of said address generator means so that said output produces a coded signal defining an internal binary address signal corresponding to one of said predetermined binary address signals included in a received binary data word message; and
an address recognition means including one comparator means having first and second inputs, said first input receiving the binary address signals of said received binary data word messages and said second input receiving the output of said address generator means, and said one comparator means further including an output for producing an equality logic signal when said first and said second inputs receive matching received and internal address signals.

4,130,875

APPARATUS FOR REDUCING THE SCALE FACTOR VARIATION FOR DIGITAL RESOLVER TYPE CONVERTERS AND THE LIKE

Seymour Lanton, Plainview, N.Y., assignor to ILC Data Device Corporation, Bohemia, N.Y.

Filed Mar. 4, 1977, Ser. No. 774,696
Int. Cl.[2] G06J *1/00*; H03K *13/02*
U.S. Cl. 364—603 **18 Claims**

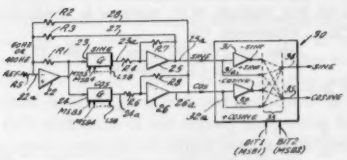
14. Means for generating signals representative of the sine

and cosine of an angle θ where θ may vary over a predetermined range comprising:

an input terminal for receiving a reference input signal;

sine and cosine multiplier circuits each having first inputs for receiving said reference signal;

said sine and cosine multipliers including angle information input means being adapted to generate output signals



equal to the product of the reference signal and sin θ and cos θ respectively wherein θ is applied to said angle information input means in binary form;

means for amplifying the output signals of said multipliers;

means for summing said amplified output signals and for positively feeding back said sum to the reference input terminal for significantly reducing the scale factor variation of the sine and cosine outputs.

4,130,876

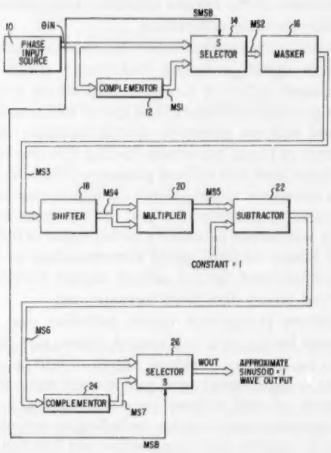
METHOD OF AND APPARATUS FOR COMPOSING APPROXIMATE SINUSOIDAL WAVEFORM

Yasuhiro Mitsuhashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 27, 1977, Ser. No. 801,023

Int. Cl.² G06F *15/34*

U.S. Cl. 364—721 **4 Claims**



1. A method of composing an approximate sinusoidal waveform which comprises the steps of:

producing digital phase inputs specifying in digital words the amplitude for each phase which varies at a substancially constant rate;

detecting a quadrant to which each phase belongs by examining the sign of the amplitude of said phase inputs;

extracting an absolute value of the amplitude for each of said phase inputs;

squaring the exact extracted absolute value of the amplitude for each phase input; and

applying a coordinate conversion process to the squared values for each of the detected third and fourth quadrants so as to form a sinusoidal waveform approximated by square curves.

4,130,877

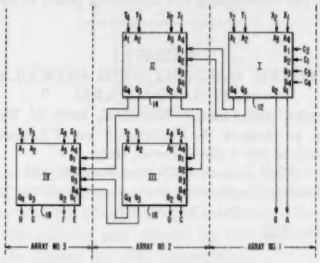
BINARY MULTIPLIER USING IDENTICAL MEMORIES OR IDENTICAL NETWORKS

Henry G. Riekers, Glen Burnie, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 24, 1977, Ser. No. 761,826

Int. Cl.² G06F *7/52*

U.S. Cl. 364—758 **1 Claim**



1. A digital multiplier for multiplying a first multibit digital number by a second multibit digital number to produce a multibit product, said multiplier comprising:

(a) a plurality of arrays of digital memories, denoted as 1 through M, each of said arrays comprising at least one digital memory, each of said memories being identically programmed wherein:

(1) said at least one memory comprising said first array having address inputs for receiving a plurality of the bits of said first and second digital numbers with said first array including outputs for providing a partial product signal and a carry input signal to the second array;

(2) each of said arrays having a position between 2 and M-1, inclusive, each having address inputs for receiving a plurality of the bits of said first and second digital numbers and carry signals from the preceding array with each of these arrays including outputs for providing a partial product and a carry signal to the subsequent array; and

(3) each memory comprising the array having the position M having address inputs for receiving a plurality of bits of said first and second digitial numbers, said array including outputs for providing a partial product signal such that;

(b) all of said partial product signals are combined to provide the product of said first and second digital numbers.

4,130,878

EXPANDABLE 4 × 8 ARRAY MULTIPLIER

Thomas J. Balph, and Richard H. Lane, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1978, Ser. No. 892,792

Int. Cl.² G06F *7/52*

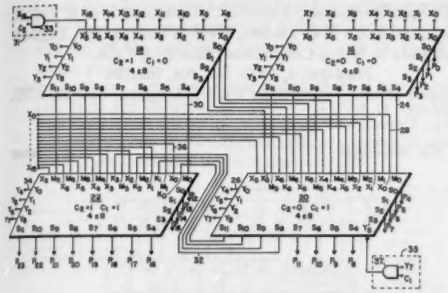
U.S. Cl. 364—758 **13 Claims**

1. A multiplier for generating the product of a first and a second binary data word comprising:

(a) first and second control terminals for receiving first and second control signals,

(b) gating means for receiving the first and second binary data words, said gating means being coupled to said first and second control terminals and being responsive to the first and second control signals for generating a selected

set of cross product signals, the selected set being determined by the first and second control signals, and



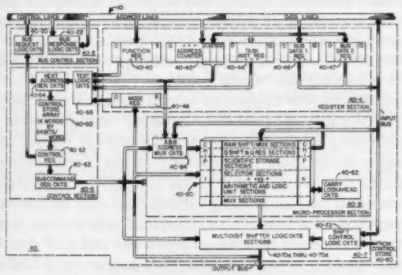
(c) adder means coupled to said gating means for summing the selected set of cross product signals and providing the product of the first and second binary data words.

4,130,879

APPARATUS FOR PERFORMING FLOATING POINT ARITHMETIC OPERATIONS USING SUBMULTIPLE STORAGE

David E. Cushing, Chelmsford, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jul. 15, 1977, Ser. No. 815,891
Int. Cl.[2] G06F 7/52
U.S. Cl. 364—748 **36 Claims**



1. An apparatus for multiplying a multiplicand by the selection of submultiples of said multiplicand in accordance with the bits of a multiplier, said apparatus comprising:

a number of multibit processor chips connected to operate in tandum, each chip having a number of terminals and including;

an arithmetic logic unit section, a multibit addressable random access memory section connected to said arithmetic logic unit section, each said memory section having a plurality of multibit storage locations, a group of said locations storing a number of different predetermined submultiple digits of said multiplicand having values selected to have a predetermined relationship to the values of bits of said multiplier used in selecting said submultiples and another location for storing a partial product value, a multibit position shift register section for storing said multiplier coupled to said arithmetic and logic unit section, a most significant bit position and a least significant bit position of each said multibit position shift register section connected to first and second ones of said number of terminals;

first conductor means connecting said second terminal of different ones of said chips to the first terminal of an alternate succeeding chip so as to enable a multidigit shifting of the multiplier digit contents of said shift register sections during a cycle of operation; and,

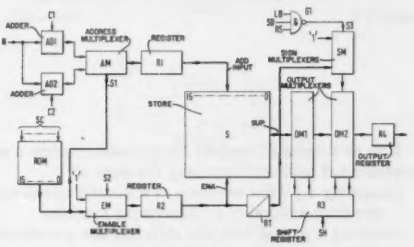
submultiple selection circuit means having a number of input terminals connected to receive selection signals from a number of said second terminals of predetermined ones of said number of chips storing a group of successive multiplier digits and output terminals connected to each said addressable random access memory section, said selection signals conditioning each of said memory sections for read out of the digits of a next submultiple of said multiplicand upon the shifting of said multiplier digit contents of said shift register sections in a predetermined direction by one bit position for summing to said partial product value stored in said another location of said memory sections by said arithmetic and logic sections for producing an output partial product generated from simultaneously processing several bits of said multiplier during said cycle of operation.

4,130,880

DATA STORAGE SYSTEM FOR ADDRESSING DATA STORED IN ADJACENT WORD LOCATIONS

Geoffrey Nutter, Cheadle, England, assignor to Ferranti Limited, Hollinwood, England

Filed Dec. 17, 1976, Ser. No. 751,953
Claims priority, application United Kingdom, Dec. 23, 1975, 52679/75
Int. Cl.[2] G06F 13/00, 7/22
U.S. Cl. 364—900 **10 Claims**



1. An information storage and retrieval system for storing operands comprising N bits, said system comprising:

(a) storage means having and output and having a plurality of multiple-bit word locations and arranged for storing multiple-bit operands each occupying part of at least of two or more adjacent word locations, each word location having defined boundaries and M bits, M being less than N;

(b) store addressing means coupled to said storage means for generating the addresses for each of N selected consecutive bits of an operand in two adjacent word locations and for applying these addresses simultaneously across word boundaries to said adjacent word locations;

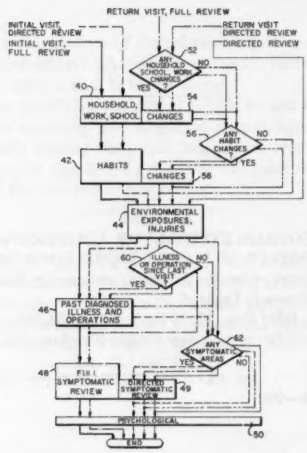
(c) store enabling means coupled to said storage means for determining selectively which of the bits so addressed by said store addressing means is read out; and

(d) shift means coupled to said output of said storage means for shifting the N bits read out from said storage means to assemble the N addressed bits of the operand from the adjacent word locations in a desired sequence.

4,130,881
SYSTEM AND TECHNIQUE FOR AUTOMATED MEDICAL HISTORY TAKING

Herbert A. Haessler, Lincoln; Errol L. Elshtain, Lexington, and Taffy Holland, Lincoln, all of Mass., assignors to Searle Medidata, Inc., Skokie, Ill.

Continuation of Ser. No. 164,690, Jul. 21, 1971, abandoned. This application Jan. 28, 1974, Ser. No. 437,052
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—900 5 Claims



1. In an automated medical history taking system a machine implemented method comprising the steps of:

presenting a patient selection of a desired questioning routine from a plurality of questioning routines;

receiving a patient response directing the presentation of a patient-selected one of said questioning routines;

presenting by stored program control from a processor through a data link a plurality of questions and associated answers comprising said patient selected one of said questioning routines on a patient answer responsive display for developing a medical history of a patient from answers to each of said questions selected by said patient;

receiving by a data link data representing the selected one or more answers to each of said questions;

selecting by stored program control responsive to received answers selected by said patient, predetermined ones of said plurality of questions for presentation to said patient to provide a selected mode of review;

storing data in a memory representative of received answers selected by said patient;

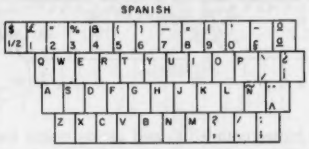
under stored program control automatically presenting for answer by said patient a question medically related to predetermined ones of said received answers in response thereto even if the medically related question is not one of said predetermined ones of said questions;

said stored step resulting in a memory stored set of answers which result in a history for said patient.

4,130,882
LANGUAGE TRANSLATING APPARATUS AND METHODS THEREFOR

H. Wallace Swanstrom; Kenneth C. Campbell, both of Dallas, Tex., and Robin F. G. Linford, Welwyn Garden City, England, assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 6, 1976, Ser. No. 702,784
Claims priority, application United Kingdom, Jul. 29, 1975, 31701/75
Int. Cl.[2] G06F *15/00*
U.S. Cl. 364—900 5 Claims



1. In an automatic word processing system including a keyboard, a printer and processor means for carrying out word processing functions indicated at the keyboard, each of which is connected to a common data bus and a common instruction word bus carrying instructions from said computer, improved apparatus for translating character information comprising:

keyboard position information entered on said data bus at said keyboard, and

language translation means for translating said keyboard position information as a function of a selected one of a plurality of language formats into media codes acceptable to said processor means, said language translation means being connected to said common data bus and said common instruction word bus and further including:

a plurality of read-only memory storage means addressable for providing said media codes,

means operatively connected to said common data bus and said plurality of read-only memory storage means for addressing said read-only memory storage means, along said common data bus, enabling means operatively connected to said common data bus and said common instruction word bus, for reading various read only memories for operation as a function of computer instructions present on said common instruction word bus and said data bus, output gating means for gating information read from said read only memories to said common data bus, said output gating means being operatively connected to said common data bus and said common instruction word bus and controlled by instructions on said common instruction bus, printer data memory for supplying printer codes for operation of said printer in one of a plurality of language formats, said printer data memory being operatively connected to said common data bus for receiving data from said gating means and said common instruction word bus, and further means within said language translation means for addressing certain read only memories for translating certain specific media codes.

4,130,883
DATA COMMUNICATION SYSTEM HAVING BIDIRECTIONAL STATION INTERFACES

Dean W. Hazelton, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

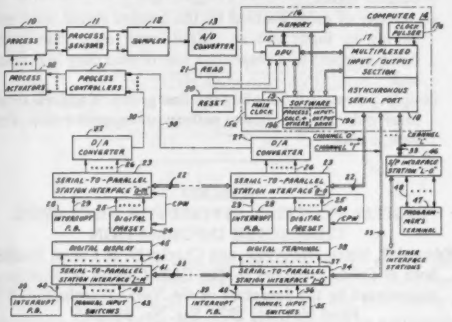
Filed Oct. 14, 1975, Ser. No. 621,973
Int. Cl.[2] G06F *3/04, 5/04*
U.S. Cl. 364—900 20 Claims

1. A digital data communications system comprising:

(a) digital computer means having a serial access port, a data processing unit, a memory, and software-controlled means for producing and storing in said memory at least one bidirectional channel sequence of serial data signals representing data to be communicated, each channel sequence

representing one or more station bit frames each having serial data bits but excluding protocol bits, said software-controlled means also producing a plurality of bidirectional data flow control signals based on software control logic for controlling movement of the serial data signals in and out of the computer memory by way of the serial access port;

(b) at least one serial data transmission channel having separate lines for bidirectional communication of the serial data signals and the bidirectional data flow control signals between the computer means serial access port and one or more remote stations on each channel; and



(c) separate series-to-parallel station interface means connected at each said one or more remote stations on each data transmission channel, each interface means circuited for: .1 receiving and transmitting the data flow control signals from the computer means to each interface means on a given channel based on the computer software control logic, .2 receiving and transmitting the sequence of serial data signals to and from the computer means and any remote station on a given channel in response to the data flow control signals, and .3 permitting parallel data communications of any one serial station bit frame of data signals between the interface means and one of two external parallel-data peripheral devices, or both, in response to the data flow control signals.

4,130,884

TEXT PROCESSING ARRANGEMENT

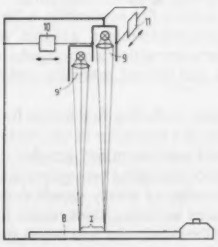
Eugen Hildinger, Soecking, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 16, 1976, Ser. No. 705,829

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537576

Int. Cl.[2] **G06F** *3/10, 13/00;* **G02B** *5/14;* **B41J** *29/42*

U.S. Cl. 364—900 **8 Claims**



1. A text processing arrangement employing a typewriter in conjunction with a storage device, in which information fed in over the typwriter keyboard can be stored and which stored information controls the printing mechanism of the typewriter in accordance therewith, the combination of a keyboard unit, a printing unit, two storage devices, each having an input, an output, and a capacity to contain the information content of a typewritten page, a corresponding selection unit for each storage device, an indicating panel structure constructed to receive and display a typewritten page, and having optical indicator means cooperable therewith, synchronizable character by character and line by line with the information flow from either storage device, to designate the location on such a page of the last supplied character, and switching means for selectively coupling said keyboard unit, printing unit, storage devices, corresponding selection units, and indicating panel, whereby, in a first switching combination information from said keyboard is simultaneously supplied to said printing unit, for printing thereby, and to one of said storage devices for storage therein, and in a second combination in the event of correction of stored textural information, information to remain unchanged is supplied from said first-mentioned storage device to said printing unit for printing thereby, and to the other of said storage devices for storage therein, and operatively connecting said optical indicating means to the storage device being read out, whereby said indicator means will follow the re-recording of such unchanged information on the initially recorded typewritten page, disposed on said indicating panel and further optical indicator means for designating a location which precedes the character designated by said first-mentioned indicator means by a predetermined number of character spaces, with the interval between the two characters so designated defining a zone within which a line may be broken, with interruption of a word if necessary.

4,130,885

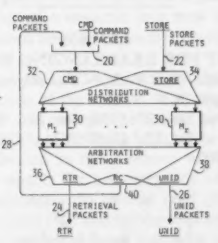
PACKET MEMORY SYSTEM FOR PROCESSING MANY INDEPENDENT MEMORY TRANSACTIONS CONCURRENTLY

Jack B. Dennis, Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 19, 1976, Ser. No. 715,723

Int. Cl.[2] **G06F** *3/00, 13/00;* **G06K** *17/00*

U.S. Cl. 364—900 **9 Claims**



1. A memory system for a digital data processor, said memory system comprising:

(a) input network means for merging signals representing components of command packets and store packets, said signals representing components of command packets and store packets consisting of signals representing transactions to be performed by said memory system;

(b) output network means for distributing signals representing components of retrieval packets, said signals representing components of retrieval packets consisting of signals representing the results of transactions specified in said signals representing components of command packets on said memory system;

(c) a plurality of sub-memory system means for holding a plurality of records representing certain of said components, said records designated by unique identifiers;

(d) distribution network means for transmitting signals representing components of said command packets and of said store packets from said input network means to mem-

bers of said sub-memory system means in correspondence with the signals representing components of said command packets and said store packets, said signals representing components of said command packets and said store packets containing signals representing said unique identifiers associated with said records contained in said sub-memory system means;

(e) arbitration network means for transmitting signals representing components of said retrieval packets from said sub-memory system means to said output network means;

(f) said signals representing components of store packets specifying data items sent to said memory system by some external device to be stored in said sub-memory system means and associated with one of one of said unique identifiers;

(g) said signals representing components of retrieval packets specifying data items retrieved from said sub-memory system means and sent to some external device;

(h) said signals representing components of command packets specifying whether a store operation or retrieval operation is to be performed on said records in order to generate and control said signals representing components of said store packets and said signals representing components of said retrieval packets, said store operation representing the storage of a data item in said memory system and said retrieval operation representing the retrieval of a previously stored data item from said memory system; and

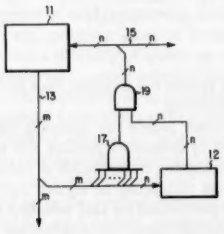
(i) each of said sub-memory system means consisting of storage means for storing data in response to signals received from said distribution network means and representing command packets specifying store operations and signals received from said distribution network means and representing store packets containing data items, retrieval means for retrieving data items from said sub-memory system means in response to signals received from said distribution network means and representing command packets specifying retrieval operations, said data items retrieved from said sub-memory system means transmitted as signals representing retrieval packets to said arbitration network means.

4,130,886

CIRCUIT FOR REARRANGING WORD BITS

Charles F. Smollin, New York, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,692
Int. Cl.[2] G06F *7/24, 7/28*
U.S. Cl. 364—900 **2 Claims**



1. In a data processing system for rearranging bits of a word according to a pattern, wherein the system includes: data bus means for conducting data signals of a word to an accumulator register; and address bus means for receiving address signals read from an addressable register;

the improvement comprising:

the address bus means being partitioned into a first group of lines for conducting, respectively, (a) a part of the address signals not greater in number than the number of data lines which comprise the data bus means and (b) a second group of lines for conducting the remaining signals of the address signals;

means for storing in the addressable register (a) the bits of the word whose bits are to be rearranged at certain addressable register positions for application to the first group of address means lines and (b) additional bits comprising a special code at other addressable register bit positions for application to the second group of address means lines;

decoding means coupled to the second group of address means lines responsive to the special code for supplying a control signal;

a plurality of gates enabled by the control signal, each gate having an input and an output, with each gate output being coupled to a respective line of said data bus means; and

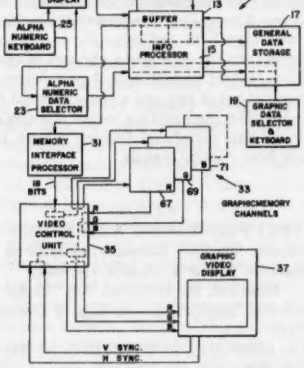
coupling means for coupling the first group of address means lines in the rearrangement pattern to respective ones of the gate inputs.

4,130,887

DIGITAL PLOTTING SYSTEM FOR DISPLAYING CHARACTER INFORMATION

Edward R. Reins, Monterey, and Charles D. B. Curry, Pacifica, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 14, 1977, Ser. No. 851,086
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—900 **10 Claims**



1. A digital plotting system comprising:

(a) processor means for processing a binary coded signal representing predetermined graphic information representing a character within a rectangular coordinate system having first and second mutually orthogonal coordinate lines;

(b) said processor including first means for sensing the initial starting point of a character in said rectangular coordinate system of said predetermined graphic information;

(c) said processor including second means for receiving and storing a plurality of binary words defining a character;

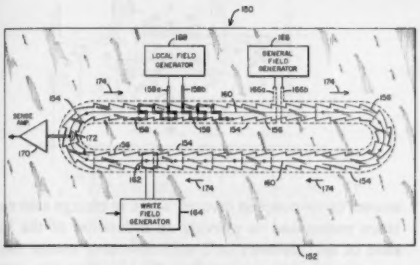
(d) said processor including third means for examining from left to right the bits in the first word stored in the second means, and from right to left the bits in the second word and in a similar sequence the remaining words in said second means; and

(e) said first means responsive to said second and third means for defining said character in a rectangular coordinate system and the bits identified by a predetermined binary number defining said character.

4,130,888
ISOTROPIC DATA TRACK FOR CROSS-TIE WALL MEMORY SYSTEM

Maynard C. Paul, Bloomington, and Ernest J. Torok, St. Paul, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,224
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—87 5 Claims

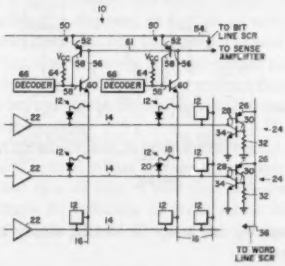


1. In a cross-tie wall memory system in which binary data are stored as inverted Néel wall sections, which inverted Neel wall sections are bounded by a cross-tie on one end and by a Bloch-line on the other end, of a cross-tie wall in a magnetic layer and in which said binary data are generated in and are serially propagated along said cross-tie wall by appropriate drive fields, the improvement in which said magnetic layer is a strip of isotropic material that is configured into a major loop configuration and in which said cross-tie wall is constrained to follow the substantial geometric centerline of said curved strip by its shape induced anisotropy.

4,130,889
PROGRAMMABLE WRITE-ONCE, READ-ONLY SEMICONDUCTOR MEMORY ARRAY USING SCR CURRENT SINK AND CURRENT SOURCE DEVICES

Hua-Thye Chua, Cupertino, Calif., assignor to Monolithic Memories, Inc., Sunnyvale, Calif.

Filed May 2, 1977, Ser. No. 792,940
Int. Cl.[2] G11C *17/06, 7/00*
U.S. Cl. 365—96 15 Claims

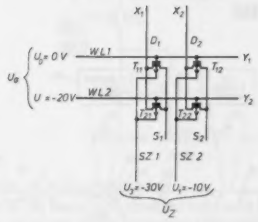


1. A programmable semiconductor memory array comprising, in combination, a plurality of memory cells interconnected to provide a memory array, and a group of Word lines and a group of Bit lines, each of said memory cells being connected to one of said group of Word lines and one of said group of Bit lines, each of said memory cells having a first electrical state prior to receiving a writing signal and a different second electrical state after receiving a writing signal, and silicon controlled rectifier means connected to each line of said group of Word lines and to each line of said group of Bit lines to provide the functions of drawing current from said group of Word lines and sourcing current to said group of bit lines and to the memory cells connected to said silicon controlled rectifier means, said silicon controlled rectifier means connected to each line of said group of word lines being located at the opposite end of the word line from a word driver.

4,130,890
INTEGRATED DDC MEMORY WITH BITWISE ERASE

Fritz G. Adam, Freiburg i. Br, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 8, 1977, Ser. No. 804,685
Claims priority, application Germany, Jul. 10, 1976, 2631165
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—184 14 Claims



1. A monolithically integrated dual-dielectric cell (DDC) memory array, comprising:

a substrate body of a first conductivity type;

a plurality of m.n. DDC field-effect transistors arranged in m columns and n rows, each of said field-effect transistors having a substrate region of a second conductivity type formed in the substrate body, the substrate regions of transistors in a column being connected together and associated with column addresses X_1 to X_m, a drain region formed within each of said substrate regions, said drain regions of transistors in a column being connected together, a source region within each of said substrate regions, said source regions of transistors in a column being connected together as a bit line, and a gate electrode, said gate electrodes of transistors in a row being connected together as word lines and associated with row addresses Y_1 to Y_n;

a load transistor associated with each column for connecting the drain regions of the column to a supply voltage U_3;

decoding, logic and potential-selecting circuit means, disposed in at least one substrate well of the second conductivity type formed in the substrate body, responsive to binary code signals for assuming one of four operating modes corresponding to bitwise read (R), bitwise erase (E_b), bitwise write (W) and matrix-wise erase (E_m) and for providing an addressed word line with potentials of U_R, U_0, U_3 or U_0 respectively upon assuming the previously mentioned operating modes, for providing an addressed substrate region with potentials of U_0, U_3, U_0 or U_3 respectively upon assuming the previously mentioned operating modes, for providing all non-addressed word lines with potentials of U_0, U_2, U_a or U_0, respectively upon assuming the previously mentioned operating modes, and for providing all non-addressed substrate regions with potentials of U_b, U_1, U_c or U_3 respectively upon assuming the previously mentioned operating modes, wherein $U_3 - U_0$ approximately equals a gate voltage sufficient for shifting the field-effect threshold voltage of the DDC transistors and wherein

$U_1 - U_0$ approximately equals $(U_3 - U_0)/3$,

$U_2 - U_0$ approximately equals $(2\ (U_3 - U_0)/3$,

$U_R - U_0$ is no greater than $U_1 - U_0$,

$U_a - U_0$ is no greater than $U_1 - U_0$.

$U_b - U_0$ is no greater than $U_1 - U_0$, and

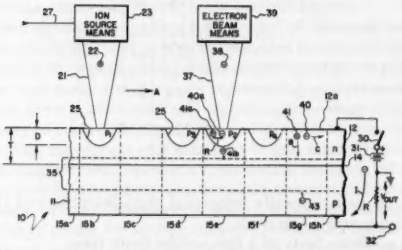
$U_c - U_0$ is no greater than $U_2 - U_0$.

4,130,891

METHODS OF GRAY SCALE RECORDING AND ARCHIVAL MEMORY TARGET PRODUCED THEREBY

Conilee G. Kirkpatrick, Schenectady, and Harold G. Parks, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,429
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—105 **18 Claims**



1. A method for substantially permanently storing multivalued gray scale information, comprising the steps of:

(a) providing a planar diode target comprised of a first polarity-type semiconductor substrate supporting a continuous remaining polarity-type layer fabricated directly thereon;

(b) focusing a beam of ions upon the major surface of the fabricated layer farthest from said substrate;

(c) implanting ions into said layer to form an auxiliary semiconductor region at selected sites of a two-dimensional array of possible data storage sites defined on the major surface of the fabricated layer furthest from said substrate; and

(d) varying a physical characteristic of each implanted region to one of a multiplicity of values in accordance with the associated value of gray scale information to be stored in substantially non-erasable manner in that auxiliary region.

4,130,892

RADIATION HARD MEMORY CELL AND ARRAY THEREOF

Thomas L. Gunckel, II, Santa Ana; Alex Rovell, Yorba Linda, both of Calif., and Robert L. Nielsen, Fairport, N.Y., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 3, 1977, Ser. No. 756,454
Int. Cl.[2] G11C *11/40, 7/02*
U.S. Cl. 365—154 **19 Claims**

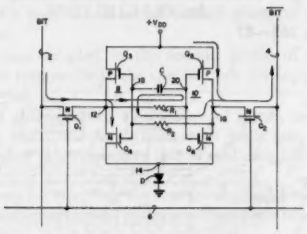
1. A radiation resistant memory cell comprising:

first and second cross-coupled inverter stages each of said inverter stages comprising a pair of transistor devices having respective conduction path electrodes and control electrodes,

the conduction path electrodes of each of said first inverter stage pair of transistor devices connected in electrical series with one another and the control electrodes of each of said first inverter stage pair of transistor devices connected together,

the conduction path electrodes of each of said second inverter stage pair of transistor devices connected in electrical series with one another and the control electrodes of each of said second inverter stage pair of transistor devices connected together, and

resistance means and capacitance means interconnected with one another to form a series connected charging current path from said first cross-coupled inverter stage to said



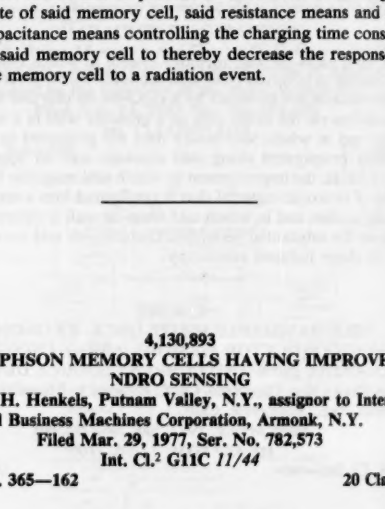
second cross-coupled inverter stage to charge said capacitance means and to provide an indication of the logical state of said memory cell, said resistance means and said capacitance means controlling the charging time constant of said memory cell to thereby decrease the response of the memory cell to a radiation event.

4,130,893

JOSEPHSON MEMORY CELLS HAVING IMPROVED NDRO SENSING

Walter H. Henkels, Putnam Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,573
Int. Cl.[2] G11C *11/44*
U.S. Cl. 365—162 **20 Claims**



1. A memory cell array for storing binary information each cell comprising:

a superconductive loop which stores binary information in the form of equal magnitude clockwise and counterclockwise circulating currents in said loop, said loop containing first and second branches said branches having different values of inductance,

a first switchable device which carries Josephson current having a given minimum value of current at which said first device resets disposed in said first branch,

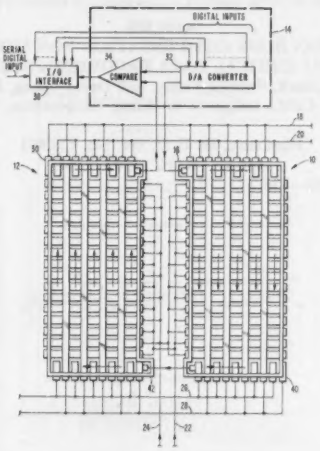
means connected to said loop for applying a given cell current, and,

a second switchable device which carries Josephson current disposed in electromagnetically coupled relationship with said second branch.

4,130,894
LOOP ORGANIZED SERIAL-PARALLEL-SERIAL MEMORY STORAGE SYSTEM

Richard B. Merrill, Millwood, and Yen S. Yee, White Plains, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,729
Int. Cl.[2] G11C *27/00*
U.S. Cl. 365—183 7 Claims



1. A loop organized serial-parallel-serial memory structure comprising:

a first signal storage array including signal storage elements arranged in rows and columns wherein said rows are functionally arranged from a top row to a bottom row and said columns are functionally arranged from a left column to a right column,

a second signal storage array including signal storage elements arranged in rows and columns wherein said rows are functionally arranged from a top row to a bottom row and said columns are functionally arranged from a left column to a right column, said second signal storage array being functionally disposed to the left of said first signal storage array such that said left column of said first signal storage array is proximately opposed to said right column of said second signal storage array and are mutually separated by a central region intermediate said first and second signal storage arrays,

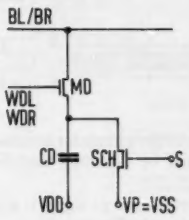
a signal input means located in said central region in between said first and second signal storage arrays and connected to a selected row of one of said first and second signal storage arrays for entering an input signal into said selected row of one of said first and second signal storage arrays,

a signal output means located in said central region and connected to a selected row of the other of said first and second signal storage arrays in juxtaposition to said signal input means for removing an output signal from said selected row of the other of said first and second signal storage arrays, and transfer signal means connected to said first and second signal storage arrays for transferring said input signal entered into said one of said first and second storage arrays through said one of said first and second storage arrays; out of said one of said first and second arrays; and into said other of said first and second arrays; through said other of said first and second storage arrays; and out of said output means as an output signal.

4,130,895
STORAGE MODULE

Klaus Zibert, Hohenschäftlarn, and Paul W. Von Basse, Wolfratshausen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 15, 1977, Ser. No. 806,586
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1976, 2633558
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—202 3 Claims



1. A storage module comprising

a plurality of bit lines each divided into two bit line portions,

a plurality of word lines arranged intersecting said bit line portions,

a pair of compensation word lines each intersecting one bit line portion of each of said bit lines,

a plurality of storage cell, each of said storage cells including a cell selector transistor having a controlled conduction path and a control electrode connected to a word line, and a storage capacitor connected in series with said controlled path between a bit line portion and a supply potential,

a plurality of compensation cells, each of said compensation cells including a compensation cell selector transistor having a controlled path and a control electrode connected to a compensation word line, and a compensation capacitance connected in series with said controlled path between the respective bit line portion and the supply potential,

means connected to the junctions of each of said compensation cell selector transistors and its serially connected compensation capacitance and operable prior to reading to apply a fixed operating potential thereto and place said bit line portions at a predetermined potential which is between the potential defining a binary "1" and the potential defining a binary "0",

each of said compensation cell selector transistors including a capacitance which together with said compensation cell capacitance is equal to a capacitance increase experienced by the opposite bit line portion upon selection of a storage cell.

4,130,896
PERIPHERAL CIRCUIT IN A MEMORY SYSTEM

Masaaki Inadachi, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 1, 1977, Ser. No. 773,418
Claims priority, application Japan, Mar. 5, 1976, 51-23322
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—203 3 Claims

1. A peripheral circuit in a memory system comprising:

a plurality of word lines;

a plurality of digit lines;

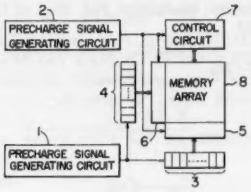
memory means including a plurality of memory cells for outputting stored signals to a corresponding one of said digit lines in response to a predetermined signal on a corresponding one of said word lines;

a first circuit for outputting a first precharge signal except when an external clock signal is applied thereto;

a word address buffer circuit for outputting first internal

address signals in response to first external address signals, said word address buffer circuit being disabled when said first precharge signal is applied thereto; and

a word driver circuit connected to receive the output of said



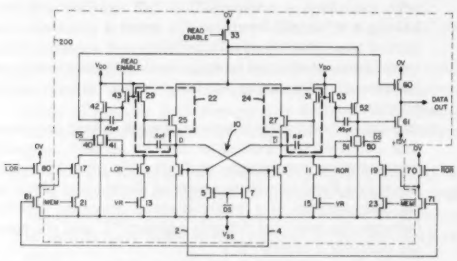
word address buffer circuit for selectively enabling one of said word lines by decoding said first internal address signals,

wherein said first precharge signal is applied exclusively to said word address buffer circuit.

4,130,897
MNOS FET MEMORY RETENTION CHARACTERIZATION TEST CIRCUIT WITH ENHANCED SENSITIVITY AND POWER CONSERVATION

Merton A. Horne, Eagan, and Bruce A. Brillhart, Minneapolis, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 3, 1977, Ser. No. 821,271
Int. Cl.[2] G11C *11/40, 7/00*
U.S. Cl. 365—205 **7 Claims**



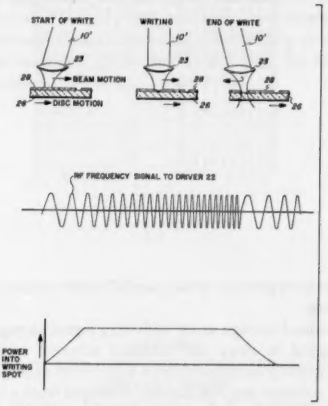
1. An improved sense latch circuit of the type coupled to an array of semiconductor memory cells and selectively operable in a read or a memory retention interrogation mode for reading binary data from said memory cells or for testing each of said memory cells to determine a plurality of analog threshold voltages peculiar to each of said memory cells with a minimum amount of disturb on the threshold voltages, said sense latch circuit comprising a bistable latch means having first and second output nodes and two stable electrical states established on said output nodes, each of said stable electrical states represented by two output potentials having a relative voltage separation therebetween for comparing two signals, at least one of said two signals functionally related to one of said plurality of threshold voltages, memory select means coupled to said memory cells and said bistable latch means for coupling said signals functionally related to said threshold voltages to said bistable latch means, reference voltage select means coupled to a reference voltage source and said bistable latch means for coupling a reference voltage to said bistable latch means and override select means coupled to said reference voltage select means and said memory select means for selectively coupling said reference voltage and said signals functionally related to said threshold voltages to said bistable latch means, wherein the improvement comprises:

transistor means coupled to said override select means and said memory select means and responsive to first and second voltages for increasing said relative voltage separation of said stable electrical states and isolating portions of said sense latch circuit as said bistable latch assumes its stable electrical states to reduce the power consumption of said sense latch circuit during its read or memory retention interrogation modes.

4,130,898
MOTION BLUR COMPENSATION FOR MOVING MEDIA OPTICAL DATA RECORDING SYSTEM

John C. Urbach, Portola Valley, and David Cheng, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1977, Ser. No. 828,801
Int. Cl.[2] G11C *13/08, 7/00*
U.S. Cl. 365—215 **5 Claims**



1. In an optical memory system including means for producing a light beam of high intensity, a material capable of having the optical characteristics of discrete areas thereof modified by a high intensity light beam, means for rotating said material, and means for directing said high intensity light beam so that it is incident upon discrete areas of said material when said material is rotating, the improvement comprising:

means for deflecting said high intensity light beam such that when said material is rotating said light beam has a motion substantially equal to at least a component of motion of a discrete area of said material whereby motion blur is minimized.

4,130,899
SYSTEM FOR OPERATING VOLATILE MEMORY IN NORMAL AND STANDBY MODES

Rodney V. Bowman, and Martin H. Francis, both of Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 25, 1977, Ser. No. 854,856
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—222 **7 Claims**

6. A memory system for operating in a normal mode and a standby mode, comprising:

a dynamic cell semiconductor memory array having control lines thereto;

TTL drivers having outputs connected to said control lines for providing control and refresh functions to said array during said normal mode;

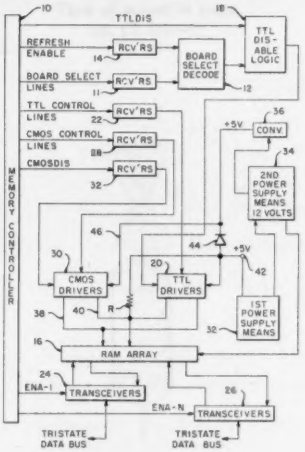
CMOS drivers having outputs connected to said control lines for providing refresh functions to said array during said standby mode;

memory controller means for controlling said TTL drivers and said CMOS drivers;

said memory controller means including means for enabling said TTL drivers and disabling said CMOS drivers when said system operates in said normal mode and for enabling said CMOS drivers and disabling said TTL drivers when said system operates in said standby mode;

first and second power supply means for supplying, respectively, first and second voltage levels to said TTL and CMOS drivers, respectively;

a diode connected between said first and second power supply means to maintain a voltage level at said second



power supply means which is slightly less than said first voltage level when said second power supply means fails to supply said second voltage to said CMOS drivers;

some of said outputs of said TTL drivers having sufficient voltage levels to enable said control and refresh functions to be performed, and

a pull-up resistor connected to said first voltage level for each of said outputs of said TTL drivers having insufficient voltage levels to provide a sufficient voltage level to enable said control and refresh functions, said pull-up resistor having a value which provides a voltage drop thereacross which is close in value to the voltage drop which appears across said diode.

4,130,900

MEMORY WITH COMMON READ/WRITE DATA LINE AND WRITE-IN LATCH CIRCUIT

Masafumi Watanabe, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

Filed Apr. 25, 1977, Ser. No. 790,815
Claims priority, application Japan, Apr. 26, 1976, 51-47379
Int. Cl.[2] G11C *8/00, 7/06*
U.S. Cl. 365—230 **6 Claims**

1. A semiconductor memory device comprising:

(a) a memory array consisting of a plurality of memory cells arranged in XY matrix form,

(b) an X decoder for designating the X direction address of the memory cells,

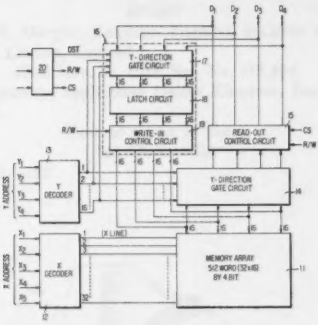
(c) a Y decoder for designating the Y direction address of the memory cells,

(d) a first Y direction gate circuit connected to the Y decoder and the memory array for reading out the data addressed by the X and Y decoders,

(e) a read-out control circuit connected to the first Y direction gate circuit,

(f) a plurality of data lines connected to the read-out control circuit for common data writing-in and data reading out,

(g) a write-in circuit having a second Y direction gate circuit connected to the data lines for reading data therein in a word unit in sequence and for selecting a plurality of memory cells in sequence in accordance with Y address



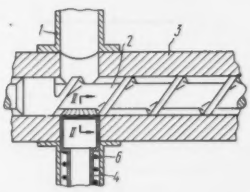
signals designating the memory cells, a latch circuit connected to the second Y direction gate circuit for temporarily holding data read in the gate circuit and a write-in control circuit connected to the latch circuit and the memory array for writing data held in the latch circuit into the respective memory cells selected by the second Y direction gate circuit.

4,130,901

PLASTICATION ARRANGEMENT IN A MACHINE FOR PROCESSING POLYMERIC MATERIALS

Sofia M. Borovikova, ulitsa Kravchenko, 4, korpus 1, kv. 21, Moscow; Evgeny V. Lurie, stantsia Udelnaya, ulitsa Solnechnaya, 9, Moskovskaya oblast, and Valery F. Mikhailov, Schelkovskoe shosse, 86, kv. 28, Moscow, all of U.S.S.R.

Filed Sep. 8, 1977, Ser. No. 831,410
Int. Cl.[2] B29B *1/10*
U.S. Cl. 366—163 **9 Claims**



1. A plastication arrangement for processing polymeric materials, comprising:

an elongated heated generally cylindrical casing;

a rotatable screw axially disposed within said casing for feeding plasticized materials along the longitudinal axis thereof;

a charging hopper for polymeric material having an outlet adjacent and in communication with a portion of said screw;

drain means for creating reduced pressure within said casing;

filter means within said casing adjacent said screw for preventing material within said casing from entering said drain means; and

means for cleaning said filter means when said screw is rotated.

DESIGNS

DECEMBER 19, 1978

250,556
CANDY UNIT
Arthur T. Shorin, New York, N.Y., and Leonard Brown, Piscataway, N.J., assignors to Topps Chewing Gum, Incorporated, Brooklyn, N.Y.
Filed Mar. 4, 1977, Ser. No. 774,639
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—22

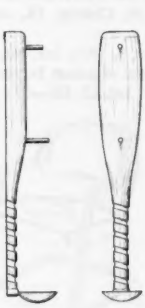
250,557
HAMBURGER PATTIE
Melvin B. Leeb, 27681 Laurell La., North Olmsted, Ohio 44070
Filed Nov. 22, 1976, Ser. No. 743,961
Term of patent 14 years
Int. Cl. D1—*04*
U.S. Cl. D1—26

250,558
SHIRT
Peter W. S. Morgan, Keighley, England, assignor to Dunlop Limited, London, England
Filed Nov. 29, 1976, Ser. No. 745,524
Claims priority, application United Kingdom, Jun. 9, 1976, 976029/76
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—215

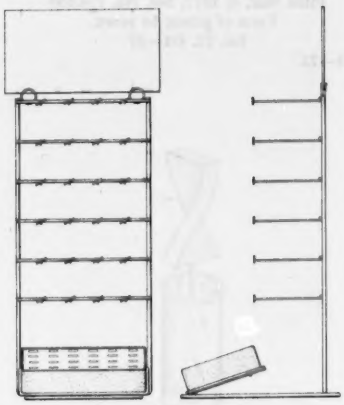
250,559
CHAIR OR SIMILAR ARTICLE
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division
Filed Apr. 1, 1977, Ser. No. 783,783
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

250,560
EYEGLASS RACK
Kenneth S. Gordon, 4320 Greer Rd., Woodland Hills, Calif. 91364
Filed Dec. 5, 1977, Ser. No. 857,364
Term of patent 14 years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—85

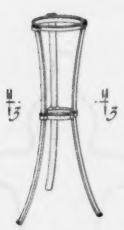
250,561
RACK
David Phillips, Chattanooga, Tenn., assignor to Carroll D. Groner, Chattanooga, Tenn.
Filed Jan. 12, 1977, Ser. No. 758,639
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



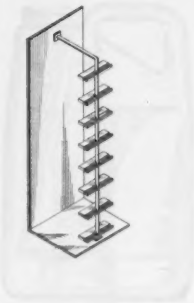
250,562
FINGER RING DISPLAY STAND
Thomas A. Newman, Cranston, R.I., assignor to McGrath-Hamin, Inc., Providence, R.I.
Filed Dec. 12, 1977, Ser. No. 859,719
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—141



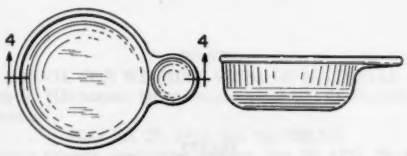
250,563
STAND FOR SUPPORTING AN ICE BUCKET, POT, VASE OR SIMILAR ARTICLE
Edwin S. Getner, 2549 Alveston Dr., Bloomfield Hills, Mich. 48013
Filed Oct. 18, 1976, Ser. No. 733,452
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—176



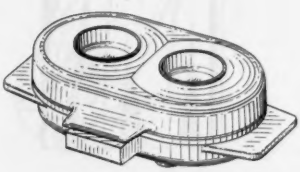
250,564
EYEGLASS RACK
Kenneth S. Gordon, 4320 Greer Rd., Woodland Hills, Calif. 91364
Filed Dec. 5, 1977, Ser. No. 857,365
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—188



250,565
BOWL OR THE LIKE
Davin B. Stowell, Corning, N.Y., assignor to Corning Glass Works
Filed Feb. 28, 1977, Ser. No. 772,520
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—20

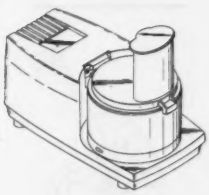


250,566
DOUGHNUT COOKER OR SIMILAR ARTICLE
Samuel L. McNair; Donald L. Avise, both of Kansas City, Mo., and Foster L. Talge, Lake Quivira, Kans., assignors to Dazey Products Company, Industrial Airport, Kans.
Filed Nov. 26, 1976, Ser. No. 745,987
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—88



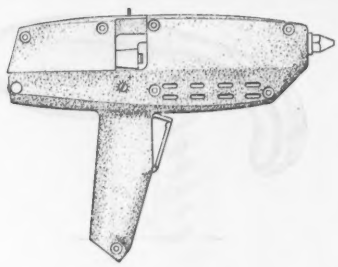
250,567
KNIFE HANDLE
Carl-Arne Breger, Malmö, Sweden, assignor to Shapes Establishment, Vaduz, Liechtenstein
Filed Jan. 31, 1977, Ser. No. 764,155
Claims priority, application Sweden, Jul. 30, 1976, 761519
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—152

250,568
FOOD PROCESSOR
Irving R. Belinkoff, Queens Village, N.Y., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.
Filed Mar. 10, 1977, Ser. No. 776,333
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153



250,569
HANDLE SUPPORT FOR WEED CUTTING IMPLEMENTS
Raymond A. Smith, Rte. 8, Box 157, Lexington, N.C. 27292
Filed Jul. 8, 1977, Ser. No. 813,876
Term of patent 14 years
Int. Cl. D8—*01, 03*
U.S. Cl. D8—8

250,570
HAND-HELD HOT MELT DISPENSER
Richard M. Elliott, Beverly, Mass.; Steve A. Unger, Raymond, N.H.; Michael J. Mercadante, North Quincy, Mass.; David S. Urbanus, South Easton, Mass., and Gregory F. Fossella, Marshfield, Mass., assignors to USM Corporation
Filed Jan. 17, 1977, Ser. No. 760,139
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



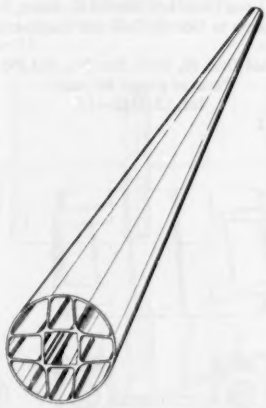
250,571
BOAT CLEAT
Peter L. Winslow, 934 Nita Ct., Chule Vista, Calif. 92011
Filed Feb. 2, 1977, Ser. No. 764,860
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382

250,572
BOTTLE OR THE LIKE
John R. Sneeden, Westerville, and George L. Schrader, Columbus, both of Ohio, assignors to Corco, Inc., Worthington, Ohio
Filed Jan. 10, 1977, Ser. No. 758,326
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—52

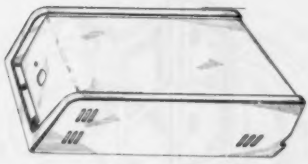
250,573
BOTTLE
Bisked U. Evangelista, 1363 Skyhawk Cir., Virginia Beach, Va. 23454, and Eugenio D. Caburian, 4020 Foxwood Dr., Virginia Beach, Va. 23462
Continuation-in-part of Ser. No. 779,058, Mar. 18, 1977, Pat. No. 247,092, which is a division of Ser. No. 649,572, Jan. 15, 1976, Pat. No. 247,158. This application Jan. 24, 1978, Ser. No. 871,796
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—66

250,574
BOTTLE
Allan John Boyle, 6 Cherry Tree La., Wheathamstead, England
Filed Jun. 14, 1976, Ser. No. 695,785
Claims priority, application United Kingdom, Dec. 15, 1975, 973660
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—108

250,575
SPOOL FOR WINDING WEBS OF MATERIAL
Östen H. Håkansson, Drivhusvagen 14, S/281 00 Hässleholm, Sweden
Filed Jul. 28, 1976, Ser. No. 709,526
Claims priority, application Sweden, Jan. 29, 1976, 76-173
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—249

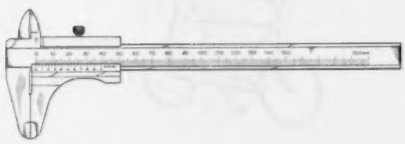


250,576
THERMOSTAT OVERIDE HOUSING
Gerald F. Hoffman, Excelsior, Minn., assignor to Fabri-Tek Incorporated, Minneapolis, Minn.
Filed Mar. 21, 1977, Ser. No. 779,812
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—60



250,577
STARFINDER
B. C. Thompson, and Marvin W. Lutes, both of Arlington, Tex., assignors to RoVi Plastics, Inc., Fort Worth, Tex.
Filed Nov. 18, 1976, Ser. No. 742,760
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65

250,578
CALIPER
Kaoru Onuma, Utsunomiya, Japan, assignor to Mitutoyo Manufacturing Company, Ltd., Tokyo, Japan
Filed Nov. 17, 1976, Ser. No. 742,725
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

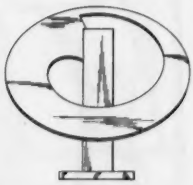


250,579
CHIME HOUSING
William B. Donnelly, Syracuse, N.Y., assignor to General Electric Company
Filed Dec. 28, 1976, Ser. No. 755,112
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—118

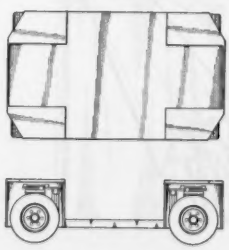
250,580
LAPEL PIN OR SIMILAR ARTICLE
Richard C. Hart, 445 NW. 35th St., Boca Raton, Fla. 33532
Filed Jun. 7, 1976, Ser. No. 693,279
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—48

250,581
PENDANT
David Savage, 16 Stedman St., Brookline, Mass. 02146
Filed Apr. 15, 1977, Ser. No. 787,996
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—72

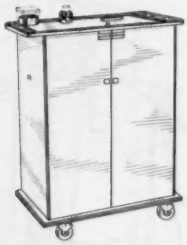
250,582
TROPHY
John H. Safer, Rockville, Md., assignor to Deane R. Beman, Washington, D.C.
Filed Aug. 24, 1977, Ser. No. 828,163
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131

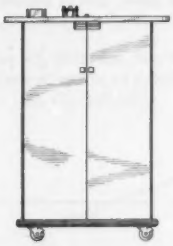


250,583
PERSONNEL AND MATERIAL CARRYING TRAILER
Earl L. Miner, Long Lane, and Harold G. Jones, Lebanon, both of Mo., assignors to Detroit Tool and Engineering Company, Lebanon, Mo.
Filed Dec. 20, 1976, Ser. No. 752,255
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—1

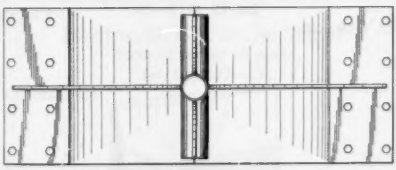


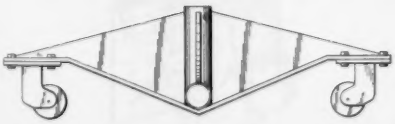
250,584
COMBINATION MEDICAL SUPPLY CART AND CABINET
Lloyd J. Oye, Rancho Palos Verdes, Calif., assignor to Trans-Aid Corporation, Carson, Calif.
Filed Sep. 7, 1976, Ser. No. 720,940
Term of patent 14 years
Int. Cl. D12—*02;* D24—*99*
U.S. Cl. D12—28



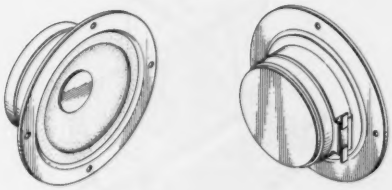


250,585
MOBILE SUPPORT PLATFORM FOR VEHICLES
William J. Meis, 6 Valley Dr., Crescent, Iowa 51526
Continuation-in-part of Ser. No. 741,251, Nov. 12, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,717
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—31

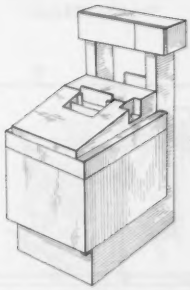




250,586
LOUDSPEAKER
Dale A. Nussdorfer, and William L. Hayes, both of Anaheim, Calif., assignors to Altec Corporation, Anaheim, Calif.
Filed Apr. 15, 1976, Ser. No. 677,284
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30

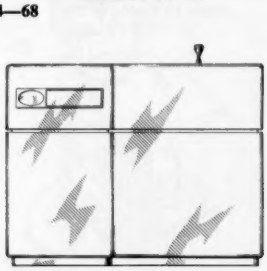


250,587
COMPUTATIONAL MODULE
Alexander Gelbman, Gaithersburg; Charles I. Soodak, Silver Spring, both of Md.; Stephen G. Hauser, Tarzana; James G. Bruni, Manhattan Beach, both of Calif., and Willard E. Fordham, Laurel, Md., assignors to Baxter Travenol Laboratories, Inc.
Filed Sep. 24, 1976, Ser. No. 726,379
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42

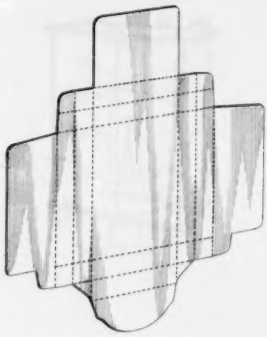


250,588
COMBINED DISPLAY AND KEYBOARD TERMINAL
William N. Mayer, White Bear Lake; Richard K. Kirchner, Bloomington, and Nicholas C. Andreadakis, White Bear Lake, all of Minn., assignors to Modern Controls Inc., Minneapolis, Minn.
Filed Nov. 22, 1976, Ser. No. 743,694
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43

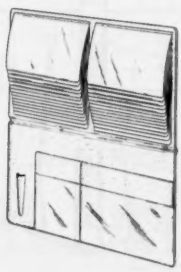
250,589
WALL MOUNTABLE RADIO TRANSCEIVER FOR USE WITH A CORDLESS TELEPHONE
Robert L. Greene, 187 W. Orangethorpe, Placentia, Calif. 92670
Filed Mar. 4, 1977, Ser. No. 774,247
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



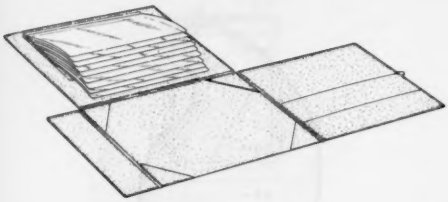
250,590
ENVELOPE BLANK
Robert Cohn, Millbrae, and Charles M. Young, Foster City, both of Calif., assignors to Champion International Corporation, Stamford, Conn.
Filed Apr. 25, 1977, Ser. No. 790,451
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D19—3



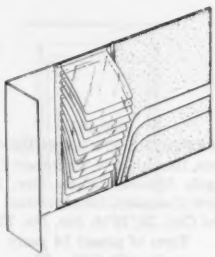
250,591
STATIONERY FOLDER
Keith R. Testro, 22 Kellett Grove, North Kew, Victoria 3102, and Rex C. Testro, 56 Campbell St., East Kew, Victoria 3102, both of Australia
Filed Nov. 12, 1976, Ser. No. 741,533
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



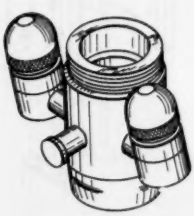
250,592
STATIONERY FOLDER
Keith R. Testro, 22 Kellett Grove, North Kew, Victoria 3102, and Rex C. Testro, 56 Campbell St., East Kew, Victoria 3102, both of Australia
Filed Nov. 12, 1976, Ser. No. 741,535
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



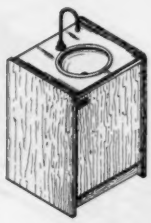
250,593
STATIONERY FOLDER
Keith R. Testro, 22 Kellett Grove, North Kew, Victoria 3102, and Rex C. Testro, 56 Campbell St., East Kew, Victoria 3102, both of Australia
Filed Nov. 12, 1976, Ser. No. 741,536
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



250,594
DUAL EYE WASH FOUNTAIN
David Gardner, 31211 Paseo Amapola, San Juan Capistrano, Calif. 92675
Filed Dec. 13, 1976, Ser. No. 750,081
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34

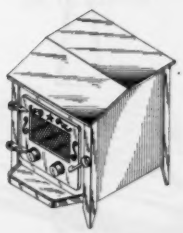


250,595
PORTABLE SINK
David L. Tebbe, and Eugene E. Klund, both of St. Clair, Mo., assignors to Lam Craft Industries, Inc., St. Clair, Mo.
Filed Nov. 15, 1976, Ser. No. 741,966
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—59

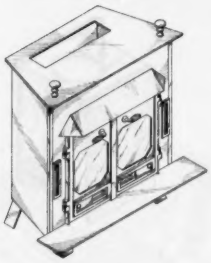


250,596
FREESTANDING FIREPLACE
Gerald L. Jonas, San Francisco, Calif., assignor to Fire Drum Corporation, San Francisco, Calif.
Filed Jun. 10, 1977, Ser. No. 805,625
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

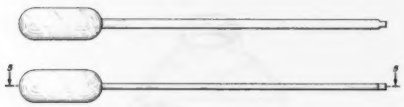
250,597
STOVE WITH GLASS WINDOW
Roy R. Whipple, P.O. Box 43, Hager City, Wis. 54014
Filed Aug. 18, 1977, Ser. No. 825,694
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



250,598
STOVE
Carrol E. Buckner, Weaverville, N.C., assignor to Buck Stove Marketing Corporation, Asheville, N.C.
Filed Oct. 26, 1977, Ser. No. 845,708
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

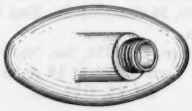


250,599
TRANSFER PIPETTE
Elmer F. St. Amand, 12744 Kahlenberg La., North Hollywood, Calif. 91607
Filed Mar. 23, 1977, Ser. No. 780,300
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—55

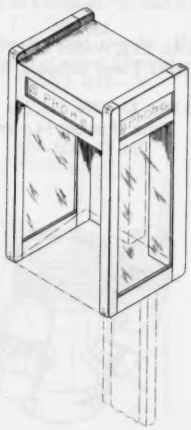


250,600
CANNULA
Ernest W. Pick, Cos Cob; Joseph M. Denaro, Stamford, and Henry R. Goerke, Norwalk, all of Conn., assignors to The Purdue Frederick Company, New York, N.Y.
Filed Sep. 8, 1977, Ser. No. 831,597
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—61

250,601
DOUCHE APPLIANCE
Ernest W. Pick, Cos Cob; Joseph M. Denaro, Stamford, and Henry R. Goerke, Norwalk, all of Conn., assignors to The Purdue Frederick Company, New York, N.Y.
Filed Sep. 8, 1977, Ser. No. 831,598
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—61



250,602
PUBLIC TELEPHONE ENCLOSURE OR THE LIKE
Louis A. Ambrosio, Brooklyn, N.Y.; Robert L. Benedetti, Clark, N.J., and Angelo Sinatra, Oyster Bay, N.Y., assignors to Western Electric Company, Incorporated
Filed Oct. 20, 1976, Ser. No. 733,980
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—16



250,603

LOWER SASH WINDOW

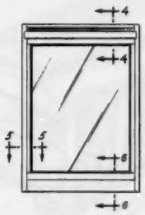
Edgar B. Roesch, Pennington, N.J., assignor to The Roesch Trust, Pennington, N.J., Lesley B. Roesch and Robert Patterson, trustees

Filed Jan. 10, 1977, Ser. No. 757,849

Term of patent 14 years

Int. Cl. D25—*02*

U.S. Cl. D25—52



250,604

UPPER SASH WINDOW

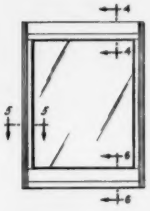
Edgar B. Roesch, Pennington, N.J., assignor to The Roesch Trust, Pennington, N.J., Lesley B. Roesch and Robert Patterson, trustees

Filed Jan. 10, 1977, Ser. No. 757,850

Term of patent 14 years

Int. Cl. D25—*02*

U.S. Cl. D25—52



250,605

BALL STRIKER OR THE LIKE

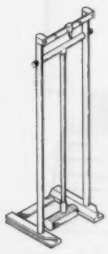
Robert C. Llamas, 4543 W. 147th, Lawndale, Calif. 90260

Filed Mar. 28, 1977, Ser. No. 781,658

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—5 R



250,606

GAME CONTROL CONSOLE

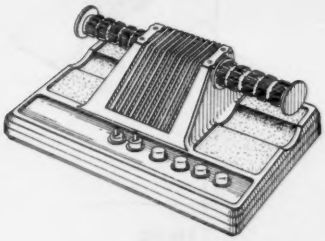
Randy K. Hall, Santa Clara, and Kevin P. McKinsey, Soquel, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Apr. 25, 1977, Ser. No. 793,797

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—5 R



250,607

GAME CONTROL CONSOLE

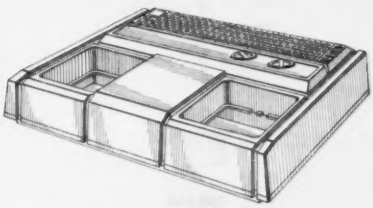
Kevin P. McKinsey, Scotts Valley, and John K. Hayashi, San Mateo, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Jun. 24, 1977, Ser. No. 809,625

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—5 R



250,608

GAME CONTROL CONSOLE

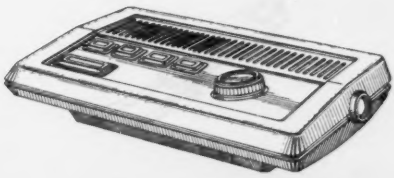
Jeffrey O. Nelson, Redwood City, and Hugh M. Lee, Dublin, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Jun. 24, 1977, Ser. No. 809,627

Term of patent 14 years

Int. Cl. D21—*01*

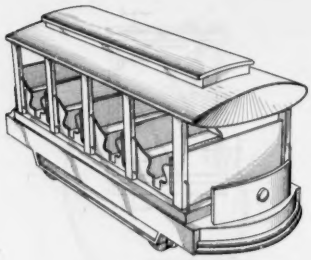
U.S. Cl. D34—5 R



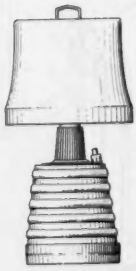
250,609
ROPE SKIPPING AMUSEMENT DEVICE
Robert T. Lang, and Geneva E. Lang, both of Rte. 4, Box 17, Marshall, Tex. 75670
Filed Aug. 12, 1977, Ser. No. 824,213
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 P

250,610
SKATE BOARD SCOOTER
Freddie L. Wynn, 736A W. Buckeye, #358, Phoenix, Ariz. 85007
Filed Mar. 21, 1977, Ser. No. 779,540
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

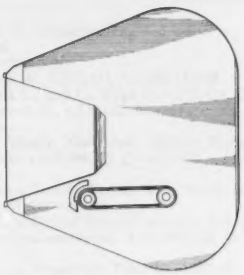
250,611
TOY VEHICLE
Gordon A. Barlow, Evanston, and Alex Imatt, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jul. 29, 1977, Ser. No. 820,357
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 MM



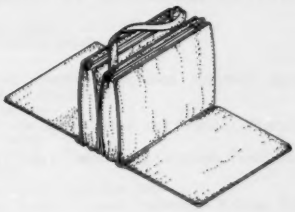
250,612
PORTABLE TABLE LAMP
Tsui Fan, Hiller, S. & Company, Inc., 12 W. 21st St., New York, N.Y. 10010
Filed Dec. 3, 1976, Ser. No. 747,205
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



250,613
RIBBON CARTRIDGE WITH RIBBON
L. Neil Goodman, Garland, and Charles J. Kubasta, Plano, both of Tex., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 14, 1977, Ser. No. 777,488
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 A



250,614
HANDBAG
Anne R. Stewart, 7710 Skyhill Dr., Los Angeles, Calif. 90068
Filed Feb. 28, 1977, Ser. No. 772,345
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



250,615
ADVERTISING MAST OR SIMILAR ARTICLE
Ralph M. DeWeese, 270 Seventh St., Wheeling, Ill. 60090
Filed Aug. 10, 1977, Ser. No. 823,543
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 D

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF DECEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abascal, Jose M. Z. Trailer loading and unloading system. 4,130,211, Cl. 214-505.000.

Abbott Laboratories: *See—*
Arbir, Francis W., 4,130,434, Cl. 106-15.00R.
Becker, Frank C.; and Li, Jorge P., 4,130,433, Cl. 106-15.00R.
Pawlak, Kenneth E., 4,130,622, Cl. 264-255.000.

Abe, Koichi: *See—*
Kadowaki, Takashi; Nishimura, Michio; Watanabe, Seiichi; and Abe, Koichi, 4,130,596, Cl. 260-655.000.

Abe, Mitsuo: *See—*
Isshiki, Tomiya; Tomita, Tetsuo; Abe, Mitsuo; and Takeda, Norio, 4,130,586, Cl. 260-566.00R.

Abell, William R., to United States of America, Army. Cable tensioning means for king post structuring. 4,129,915, Cl. 14-10.000.

Abendroth, Paul: *See—*
List, Klaus; and Abendroth, Paul, 4,130,057, Cl. 101-148.000.

ACF Industries, Inc.: *See—*
Fiedler, Timothy, 4,130,609, Cl. 261-23.00A.

Ackrell, Jack, to Syntex (U.S.A.) Inc. Novel 4-(8X-6,11-dihydrodibenzo-[b.e.]-thiepin-11-one-3-yl)-4-oxobutyric acids, methods of preparation, compositions and uses thereof. 4,130,654, Cl. 424-275.000.

Adam, Fritz G., to ITT Industries, Inc. Integrated DDC memory with bitwise erase. 4,130,890, Cl. 365-184.000.

Adams, George L.; Aker, David; and Silvermetz, David, to Envirotech Corporation. Ultrasonic transducer with reference reflector. 4,130,018, Cl. 73-290.00V.

Adams, John W.: *See—*
Engelmann, Rudolph H., 4,130,819, Cl. 340-146.3AC.

Adams Rite Manufacturing Co.: *See—*
Brkic, Ferdo, 4,130,306, Cl. 292-5.000.

Addressograph-Multigraph Corporation: *See—*
Mabrouk, Saied A.; and Morgan, Edward T., 4,130,056, Cl. 101-141.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, 4,130,703, Cl. 526-173.000.

Agfa-Gevaert, N.V.: *See—*
Gilliams, Yvan K.; De Winter, Walter F.; Van Paesschen, August J.; and Timmerman, Daniel M., 4,130,670, Cl. 427-16.000.
Monbaliu, Marcel J.; and Van Poucke, Raphael K., 4,130,427, Cl. 96-56.500.
Van Doorselaer, Marcel K., 4,130,428, Cl. 96-68.000.
Van Doorselaer, Marcel K., 4,130,429, Cl. 96-82.000.

Aho, Kenneth A., to Minnesota Mining and Manufacturing Company. Multi-part liquid container. 4,130,198, Cl. 206-221.000.

Airco, Inc.: *See—*
Wallace, Dean R., 4,130,617, Cl. 264-528.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Inada, Masami; and Kitamura, Kazuhiko, 4,130,267, Cl. 251-61.200.
Sakakibara, Naoji; and Hashimoto, Nobuyuki, 4,130,265, Cl. 251-11.000.

Akado, Hajime; Ueda, Hiroshi; Yamashita, Akira; and Tamura, Takemasa, to Nippondenso Co., Ltd. Air cleaner arrangement. 4,130,405, Cl. 55-503.000.

Aker, David: *See—*
Adams, George L.; Aker, David; and Silvermetz, David, 4,130,018, Cl. 73-290.00V.

Akiyama, Takashige: *See—*
Ichiyanagi, Takashi; Akiyama, Takashige; and Otoda, Ichizo, 4,130,676, Cl. 427-358.000.

Akkerman, Neil H.; and Ross, Richard J., to Baker International Corporation. Valve and lubricator apparatus. 4,130,166, Cl. 166-324.000.

Aksenova, Maria S.: *See—*
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.

Aktiebolaget SKF: *See—*
Hallerback, Stig L., 4,130,399, Cl. 29-225.000.

Akzo N.V.: *See—*
Hutton, Ronald E.; and Burley, Joseph W., 4,130,573, Cl. 260-429.700.

Alfa-Laval AB: *See—*
Sjoholm, Claes B.; and Martensson, Karl J. G., 4,130,053, Cl. 99-466.000.

Allaire, William P.; Mayer, William J.; and Zambetis, Thomas A., to McDonnell Douglas Corporation. Reliability monitoring system. 4,130,787, Cl. 318-565.000.

Allan, James: *See—*
Lee, Frank; Allan, James; and Fearnley, Charles, 4,130,498, Cl. 252-99.000.

Alley, F. William, to Page Belting Company. Picker stick. 4,130,141, Cl. 139-157.000.

Allied Chemical Corporation: *See—*
Lazarus, Stanley D.; and Chakravarti, Kalidas, 4,130,541, Cl. 260-45.80A.

Allis-Chalmers Corporation: *See—*
Neumann, Manfred E., 4,130,789, Cl. 323-43.50R.

Altec Corporation: *See—*
Henricksen, Clifford A., 4,130,023, Cl. 73-647.000.

Altech Industries, Inc.: *See—*
Creith, Lou C., 4,130,216, Cl. 220-224.000.

Alvarez, Manuel: *See—*
Velenovsky, Joseph J.; and Alvarez, Manuel, 4,130,629, Cl. 423-240.000.

Amano, Kenichi; Suzuki, Yutaka; and Kishi, Yoshio, to Sony Corporation. Cassette tape recording and/or reproducing apparatus. 4,130,848, Cl. 360-132.000.

Amax Inc.: *See—*
Hoover, Raul M., 4,130,626, Cl. 423-26.000.

Amazawa, Kiyoshi: *See—*
Mori, Masaharu; and Amazawa, Kiyoshi, 4,130,805, Cl. 325-473.000.

American Commercial Barge Line Company: *See—*
Nivin, James E., 4,130,125, Cl. 135-6.000.

American Cyanamid Company: *See—*
Chang, Eugene Y. C.; and Kaizerman, Samuel, 4,130,542, Cl. 260-45.9KB.
Conrow, Ransom B.; and Bernstein, Seymour, 4,130,660, Cl. 424-319.000.
Cross, Barrington; and Dawe, David H., 4,130,645, Cl. 424-226.000.
Ross, Lawrence J., 4,130,581, Cl. 260-509.000.
Spicer, Larry D.; and Simkins, Karl L., Jr., 4,130,651, Cl. 424-270.000.

American Guidance Service, Inc.: *See—*
Gale, John A., 4,129,960, Cl. 46-25.000.

American Hospital Supply Corporation: *See—*
Evans, David F.; and Yindra, Leonard J., 4,130,069, Cl. 108-136.000.

Amin, Bipinchandra: *See—*
Decker, Joseph A., Jr.; Amin, Bipinchandra; and Magruder, William R., 4,130,615, Cl. 264-46.500.

Aminkemi AB: *See—*
Rosengren, Ake; Bjellqvist, Bengt; and Gasparic, Vesna, 4,130,470, Cl. 204-180.00G.

Amos, Lynn G.; Banks, Howard F.; Buck, Robert T.; and Eppes, William R., to Corning Glass Works. Recording analyzer for electrophoretic samples. 4,130,824, Cl. 346-33.00A.

AMP Incorporated: *See—*
Asick, John C.; Huffnagle, Clifton W.; Peppler, Michael S.; and Woratyla, John A., 4,130,332, Cl. 339-97.00P.
Chandler, Curtis S.; and Miller, Ralph L., 4,130,329, Cl. 339-75.00M.
Chandler, Curtis S., 4,130,330, Cl. 339-75.00M.
Donnelly, Charles W., Sr.; and Stauffer, Larry R., 4,130,040, Cl. 83-389.000.
Neff, Nelson E.; and Thomas, Anthony F., 4,130,331, Cl. 339-97.00R.

Ampex Corporation: *See—*
Gallo, Luigi C.; and Sheikh, Junaid, 4,130,842, Cl. 360-35.000.

Amsted Industries Incorporated: *See—*
Mulcahy, Harry W., 4,130,066, Cl. 105-199.0CB.

Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Device for cleaning ink pen points. 4,130,444, Cl. 134-96.000.

Andermac, Inc.: *See—*
McLaughlin, Jack E., 4,130,118, Cl. 128-229.000.

Anderson, Brent W., to Tektronix, Inc. Ground termination and strain relief connector means. 4,130,334, Cl. 339-103.00M.

Anderson, George J.; Desmond, Timothy F.; and Santer, J. Owen, to Monsanto Company. Coating compositions comprising alkoxymethylaminotriazines, polyols and polyether triols. 4,130,692, Cl. 428-524.000.

Anderson, Nigel I. Tensioning of metal wires. 4,129,927, Cl. 24-136.00A.

Anderson, Walter W., to General Motors Corporation. Process plug for ultrasonic soldering. 4,130,232, Cl. 228-57.000.

Andersson, Einar W., to Sandvik Aktiebolag. Wedge arrangement. 4,130,270, Cl. 254-104.000.

Andre, Wolfram; and Kornaker, Walter, to International Standard Electric Corporation. Arrangement for mounting the deflection system on the envelope of a color-picture tube. 4,130,837, Cl. 358-248.000.

Andrews, Christopher M., to Ciba-Geigy Corporation. Curable epoxide resin compositions. 4,130,511, Cl. 528-92.000.

Angel Mork: *See—*
Solberg, Aasmund, 4,130,028, Cl. 74-577.00R.

Ansell Jones & Company Ltd.: *See—*
Clifford, David F., 4,130,313, Cl. 294-83.00R.

Anthony, Myron L., to Shoilco, Inc. Low-temperature oil shale and tar sand extraction process. 4,130,474, Cl. 208-11.0LE.

Aoyama, Syunichi, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,130,093, Cl. 123-119.00A.

Apple Computer, Inc.: *See—*
Holt, Frederick R., 4,130,862, Cl. 363-49.000.

Arai, Haruyoshi: *See—*
Kijima, Shizumasa; Shionoya, Hiroshi; Hamamura, Kimio; Arai, Haruyoshi; and Koyanagi, Nozomu, 4,130,648, Cl. 424-251.000.

Arai, Kojiro; and Sugai, Noriaki, to Japan Exlan Company Limited. Treatment of carbon fibers. 4,130,465, Cl. 204-27.000.

Arakelian, Rafi; and Driscoll, Michael M. Low supply voltage frequency multiplier with common base transistor amplifier. 4,130,765, Cl. 307-220.00R.

Aramaki, Azuma: *See—*
Itoh, Iko; Takahashi, Tsukasa; Takamuku, Shinkichi; Aramaki, Azuma; and Serada, Manabu, 4,130,456, Cl. 159-165.000.

Arbir, Francis W., to Abbott Laboratories. Paint compositions. 4,130,434, Cl. 106-15.00R.

Arimoto, Shunji: *See—*
Ohoka, Masataka; Yamada, Mitsuko; Shoji, Akio; and Arimoto, Shunji, 4,130,601, Cl. 260-835.000.

Armour Pharmaceutical Company: *See—*
Enkoji, Takashi; and Skibbe, Martin O., 4,130,514, Cl. 260-8.000.

Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, to Schering AG. 1,2,3-Thiadiazole-5-yl-urea derivatives, process for making the same and plant retardation and defoliation composition containing same. 4,130,414, Cl. 71-90.000.

Arndt, Richard L.; Meyerhofer, Wilfred L., Jr.; and Steinbauer, David M., to International Business Machines Corporation. Encoding mechanism for holed badge readers. 4,130,756, Cl. 235-474.000.

Arold, Hermann, to Bayer Aktiengesellschaft. Preparation of dithiophosphoric acid diester halides. 4,130,607, Cl. 260-973.000.

Arrowood, Gordon W.: *See—*
Mitchell, Wylie W.; and Arrowood, Gordon W., 4,130,302, Cl. 285-113.000.

Ashford, Donald A., to International Telephone & Telegraph Corp. Frequency channel units for a FDM system. 4,130,733, Cl. 179-15.0FD.

Ashland Oil, Inc.: *See—*
Purcell, Frederick C., 4,130,531, Cl. 260-31.4EP.

Asick, John C.; Huffnagle, Clifton W.; Peppler, Michael S.; and Woratyla, John A., to AMP Incorporated. Modular connector and crimp arrangement for magnetic wire. 4,130,332, Cl. 339-97.00P.

Askew, Crawford S. Braking device for a motor. 4,130,188, Cl. 188-170.000.

Atari, Inc.: *See—*
Derickson, Richard B., 4,130,830, Cl. 358-22.000.

Atkins, Thomas J., to Du Pont de Nemours, E. I., and Company. Tricyclic trisaminomethanes. 4,130,715, Cl. 548-324.000.

Atlantic Richfield Company: *See—*
Blieden, Harry R., 4,130,445, Cl. 136-89.0PC.
Shawl, Edward T.; Sheng, Ming N.; and Zajacek, John G., 4,130,633, Cl. 423-509.000.

Aubrey, Joseph H.: *See—*
Braddyll, John R. G.; Aubrey, Joseph H.; Shaw, Ernest A.; and Palmer, Ian, 4,130,366, Cl. 366-288.000.

Audioanalyst, Inc.: *See—*
Ostrander, Walter M.; Scholl, Malcolm M.; Minott, Edward R.; and Smith, Christopher D., 4,130,174, Cl. 181-146.000.

Aunspach, Dale, to Xomox Corporation. Rotary spring-return actuator with safety feature. 4,130,182, Cl. 185-45.000.

Automated Building Components, Inc.: *See—*
Jureit, J. Calvin; Seipos, Andrew G.; and Langevin, William J., 4,129,933, Cl. 29-417.000.

Autotrol Corporation: *See—*
Torpey, Wilbur N., 4,130,482, Cl. 210-17.000.

Avery International Corporation: *See—*
Reed, Charles F., 4,130,042, Cl. 83-887.000.

Ayerst, McKenna & Harrison Limited: *See—*
Bagli, Jehan F.; and Bogri, Tibor, 4,130,649, Cl. 424-266.000.

B. F. Goodrich Company, The: *See—*
Edwards, David V.; Lesh, Harvey B., Jr.; and Phillips, Ronald W., II, 4,129,910, Cl. 9-42.000.
Rajput, Yudh V.; and Couchot, Carl A., 4,130,323, Cl. 303-106.000.

Bachle, Erich; and Clauss, Hermann, to Licentia Patent-Verwaltungs-G.m.b.H. Monolithic integrated semiconductor circuit. 4,130,826, Cl. 357-34.000.

Bachman, Charles W.; and Franklin, Benjamin S., to Honeywell Information Systems Inc. Database instruction apparatus for determining a database record type. 4,130,867, Cl. 364-200.000.

Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Biotin intermediates. 4,130,713, Cl. 548-303.000.

Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna & Harrison Limited. Cyclohepta [B]pyridine-2-carboxylic acid derivatives. 4,130,649, Cl. 424-266.000.

Bahder, George; Eager, George S., Jr.; and Silver, David A., to General Cable Corporation. Method of making extruded solid dielectric high voltage cable resistant to electrochemical trees. 4,130,450, Cl. 156-48.000.

Bailey, John M.; and Scott, Ronald K., to Caterpillar Tractor Co. Apparatus and method for using fuel pressure to trigger an injection timing device. 4,130,013, Cl. 73-119.00A.

Baker International Corporation: *See—*
Akkerman, Neil H.; and Ross, Richard J., 4,130,166, Cl. 166-324.000.

Baker, Roxton E. Glow plug temperature circuit. 4,130,853, Cl. 361-264.000.

Baldyga, Joseph W., to Diamond Die & Mold Co. Method of making printed circuit. 4,129,939, Cl. 29-625.000.

Ballard, Denis G. H.; Cundy, Colin S.; and Rideal, Graham R., to Imperial Chemical Industries Limited. Inorganic foam. 4,130,687, Cl. 428-310.000.

Balph, Thomas J.; and Lane, Richard H., to Motorola, Inc. Expandable 4 × 8 array multiplier. 4,130,878, Cl. 364-758.000.

Ban, Itsuki; Inoue, Kyoichi; and Kogure, Takatoshi. Electronic photoflash. 4,130,780, Cl. 315-241.00P.

Bangha, Roland V.: *See—*
Jacoby, Ian H.; and Bangha, Roland V., 4,130,368, Cl. 402-41.000.

Banks, Howard F.: *See—*
Amos, Lynn G.; Banks, Howard F.; Buck, Robert T.; and Eppes, William R., 4,130,824, Cl. 346-33.00A.

Barisoni, Mario: *See—*
Marianeschi, Edmondo; Basevi, Sandro; Barisoni, Mario; Marini, Paolo; Borgianni, Carlo; and Ricci Bitti, Roberto, 4,130,447, Cl. 148-27.000.

Barker, Richard G., to Union Camp Corporation. Method of pulping with polysulfide. 4,130,457, Cl. 162-82.000.

Barker, William B.: *See—*
Heart, Frank E.; Ornstein, Severo M.; Barker, William B.; and Crowther, William R., 4,130,865, Cl. 364-200.000.

Barkhuff, Raymond A., Jr., to Monsanto Company. Method for reducing the dripping in flaming polystyrene compositions. 4,130,605, Cl. 260-876.00R.

Barlik, Richard P.: *See—*
Perry, Francis V., Jr.; Barlik, Richard P.; Richardson, William P.; Hudson, Robert H.; and Gray, Leonard, 4,129,963, Cl. 46-155.000.

Barlow Mfg. Corp.: *See—*
Sessions, Robert W.; Jeslis, Jerome; and Rodzen, Richard A., 4,130,119, Cl. 128-325.000.

Barlow, Robert M., to VanWagoner, John D., a part interest. Apparatus for collecting fluid seepage in a building structure. 4,129,967, Cl. 52-15.000.

Barnes, Hubert L.; and Shapiro, Edward, to Pittsburgh Environmental and Energy Systems, Inc. Process for removing SO_2 and NO_x from gases. 4,130,628, Cl. 423-235.000.

Barnett, Clarence E.: *See—*
Barnett, Forest H.; and Barnett, Clarence E., 4,130,155, Cl. 152-217.000.

Barnett, Forest H.; and Barnett, Clarence E. Self tightening connector for non-skid tire chains. 4,130,155, Cl. 152-217.000.

Barry, Leonard D. Side rails container transfer system. 4,130,208, Cl. 214-43.000.

Barymin Explorations Limited: *See—*
Holman, Ronald H. C., 4,130,170, Cl. 175-245.000.

Basevi, Sandro: *See—*
Marianeschi, Edmondo; Basevi, Sandro; Barisoni, Mario; Marini, Paolo; Borgianni, Carlo; and Ricci Bitti, Roberto, 4,130,447, Cl. 148-27.000.

Bates, Richard L.: *See—*
D'Antonio, Nicholas F.; and Bates, Richard L., 4,130,296, Cl. 280-612.000.

Batley, William R., Jr.; and Bray, Walter J. Process for improving the nutritional value of green plant protein. 4,130,553, Cl. 260-112.00R.

Battarel, Alain, to Compagnie Industrielle des Piles Electriques "Cipel" S.A. Pocket lamp. 4,130,859, Cl. 362-205.000.

Baughman, Robert O.: *See—*
Leber, Ralph E.; and Baughman, Robert O., 4,130,281, Cl. 273-100.000.

Bauman, Robert A., to Colgate-Palmolive Company. Anti-plaque agents. 4,130,637, Cl. 124-54.000.

Baumann, Hans-Peter: *See—*
Grassi, Guido; Baumann, Hans-Peter; and Pummer, Helmut, 4,130,589, Cl. 260-584.00B.

Bayer Aktiengesellschaft: *See—*
Arold, Hermann, 4,130,607, Cl. 260-973.000.
Scholz, Karl-Heinz; Hartmann, Wilhelm; and Heine, Hans-Georg, 4,130,563, Cl. 260-307.00C.

Becker, Frank C.; and Li, Jorge P., to Abbott Laboratories. Industrial biocides. 4,130,433, Cl. 106-15.00R.

Becker, Manfred E., to Textron Inc. Seal means for a self-aligning bearing. 4,130,324, Cl. 308-36.100.

Becker, Roger T.; Burns, Donald L.; and Calkins, Stephen P., to Kalamazoo Conveyor Company. Arcuate push-bar conveyor. 4,130,195, Cl. 198-739.000.

Becton, Dickinson and Company: *See—*
Hewitt, Raymond, 4,130,085, Cl. 118-315.000.

Beecher, Robert L., II; Hershey, Harold J.; and Zieles, Robert S., to Bell Telephone Laboratories, Incorporated. Cam actuated multiple contact spring switch. 4,130,744, Cl. 200-1.00A.

Behimer, Harold: *See*—
Giandomenico, Anthony; Dame, James M.; and Behimer, Harold, 4,130,032, Cl. 81-119.000.

Bell & Howell Company: *See*—
Overman, John W.; and Johnson, George V., 4,130,352, Cl. 353-79.000.

Bell Telephone Laboratories, Incorporated: *See*—
Beecher, Robert L., II; Hershey, Harold J.; and Zieles, Robert S., 4,130,744, Cl. 200-1.00A.
D'Altroy, Frederick A.; Hartman, Adrian R.; Jacobs, Richard M.; Pritchett, Robert L.; and Shackle, Peter W., 4,130,827, Cl. 357-38.000.
Feit, Eugene D.; and Thompson, Larry F., 4,130,424, Cl. 96-35.100.
Glass, Alastair M.; Lines, Malcolm E.; and Nassau, Kurt, 4,130,694, Cl. 429-193.000.
Miller, Stewart E.; and Ogawa, Kinichiro, 4,130,343, Cl. 350-96.150.
Plewes, John T.; and White, Philip R., 4,130,421, Cl. 75-154.000.

Bellis, Harold E., to Du Pont de Nemours, E. I., and Company. Melt oxychlorination process. 4,130,595, Cl. 260-654.00R.

Bellus, Daniel: *See*—
Greuter, Hans; Martin, Pierre; Bellus, Daniel; Gsell, Laurenz; and Meyer, Willy, 4,130,656, Cl. 424-304.000.

Belsheim, Rodney W. Swing-away mailbox. 4,130,239, Cl. 232-39.000.

Ben-Gurion University of the Negev Research and Development Authority: *See*—
Wisniak, Jaime; and Benajahu, Hanoch, 4,130,495, Cl. 252-48.400.

Benajahu, Hanoch: *See*—
Wisniak, Jaime; and Benajahu, Hanoch, 4,130,495, Cl. 252-48.400.

Bendix Corporation, The: *See*—
Woodruff, Frank, 4,130,001, Cl. 64-19.000.

Benedict, Robert P.; and Wyler, John S., to Westinghouse Electric Corp. Flow rate measuring device. 4,130,017, Cl. 73-211.000.

Benjamin, Joel M., Jr.: *See*—
Bolgiano, Duane R.; Benjamin, Joel M., Jr.; and Meyer, Victor, Jr., 4,130,731, Cl. 179-2.0EB.

Bennett, Moreland P.; and Bowers, William L., to General Electric Company. Machine for welding aluminum to aluminum. 4,130,750, Cl. 219-78.150.

Benoit, Lloyd F. Portable refacing machine. 4,130,034, Cl. 82-4.00C.

Benzoni, Andre J. E.: *See*—
Oneto, Francis E. J.; Benzoni, Andre J. E.; Poret, Jacques L.; and Simon, Fernand B., 4,130,497, Cl. 252-89.00R.

Berg, Albert T., Jr.: *See*—
Langlie, Howard; and Berg, Albert T., Jr., 4,130,147, Cl. 141-98.000.

Bergdahl, Knut E. Method and device for cleaning fluid filters. 4,130,404, Cl. 55-242.000.

Berges, David A., to Smithkline Corporation. 7-Acylamine-3-(sulfoalkyl substituted oxadiazolylthiomethyl) cephalosporins and pharmaceutical compositions containing them. 4,130,644, Cl. 424-246.000.

Berkovitz, Robert A.: *See*—
Kates, James M.; and Berkovitz, Robert A., 4,130,726, Cl. 179-1.00D.

Berniere, Michel G., to Societe Anonyme de Telecommunications. Band pass electromechanical filters. 4,130,812, Cl. 333-71.000.

Bernstein, Seymour: *See*—
Conrow, Ransom B.; and Bernstein, Seymour, 4,130,660, Cl. 424-319.000.

Berry, James A.: *See*—
Sherman, Morton; and Berry, James A., 4,129,972, Cl. 52-303.000.

Bertling, Johannes-Gerhard, to Robert Bosch GmbH. Pressure control valve. 4,130,266, Cl. 251-50.000.

Best, Donald T., to Sperry Rand Corporation. Magnetic transducer. 4,130,846, Cl. 360-120.000.

Beth Israel Medical Center: *See*—
Chryssanthou, Chryssanthos P., 4,130,395, Cl. 23-230.00B.

Bethlehem Steel Corporation: *See*—
Hazelton, Dean W., 4,130,883, Cl. 364-900.000.

Bikbau, Marsel Y.: *See*—
Nudelman, Boris I.; Sventsitsky, Alexandr S.; Bikbau, Marsel Y.; Prikhozhan, Ada M.; and Ibragimov, Isak M., 4,130,441, Cl. 106-89.000.

Bingler, Douglas J., to Milton Roy Company. Centrifugal pump assembly. 4,130,374, Cl. 415-131.000.

Binsbergen, Frederik L.: *See*—
Van Ballegooijen, Hendrik; Binsbergen, Frederik L.; Raadsen, Jacob; and Vreugdenhil, Arie D., 4,130,606, Cl. 260-894.000.

Bjellqvist, Bengt: *See*—
Rosengren, Ake; Bjellqvist, Bengt; and Gasparic, Vesna, 4,130,470, Cl. 204-180.00G.

Black, Gerall A. Apparatus for removing rainbows from flowing water. 4,130,489, Cl. 210-242.0AS.

Blackwell, Robert H., Jr., to United Technologies Corporation. Helicopter blade and rotor. 4,130,377, Cl. 416-132.00R.

Blaisdell, Ronald G.; Hall, Harold H., Jr.; and Hough, Harold L., to GTE Sylvania Incorporated. Activation means for flashlamp article. 4,130,081, Cl. 116-5.000.

Blase, Manfred, to Didier Engineering GmbH. Track rail support. 4,130,244, Cl. 238-24.000.

Blazo, Stephen F.: *See*—
Perkins, Peter E.; and Blazo, Stephen F., 4,130,775, Cl. 313-397.000.

Blieden, Harry R., to Atlantic Richfield Company. Light collector. 4,130,445, Cl. 136-89.0PC.

Block, Kenneth A.; and Lader, Leon J., to General Dynamics Corporation. Decoy means and method therefor. 4,130,059, Cl. 102-34.400.

Blume, Nicholas C., to Gresen Manufacturing Company. Hydraulic control system. 4,129,987, Cl. 60-445.000.

Bock, Erich. Fastening bar for securing printing plates on a printing machine. 4,130,058, Cl. 101-415.100.

Bockrath, Ronald E.; and Serres, Carl, to Standard Oil Company (Indiana). Solid state polymerization. 4,130,551, Cl. 528-481.000.

Bode, John J. Control system for irrigation pumps. 4,130,382, Cl. 417-12.000.

Bodig, Bernd: *See*—
Jundt, Werner; Bodig, Bernd; Sohner, Gerhard; Ruf, Walter; Roth, Helmut; and Werner, Peter, 4,130,101, Cl. 123-148.00E.

Boehringer Ingelheim GmbH: *See*—
Muller, Erich; Diederen, Willi; and Shanks, Robin G., 4,130,650, Cl. 424-263.000.
Roos, Otto; and Essig, Dieter, 4,130,558, Cl. 260-239.100.

Boeing Company, The: *See*—
Doellner, O. Leonard, 4,130,345, Cl. 350-96.220.

Boerwinkle, Fred P.; and Szauer, Tadeusz, to Northern Instruments Corporation. Corrosion inhibiting compositions. 4,130,524, Cl. 260-29.6HN.

Boggs, Brian F.; Zilcosky, Hector J.; and Smith, William M., to Ensign Bickford Company. Gun fired projectile having reduced drag. 4,130,061, Cl. 102-66.000.

Boggum, Paul; and Schulte, Klaus, to Didier-Werke A.G. Tank block. 4,130,391, Cl. 432-264.000.

Bogri, Tibor: *See*—
Bagli, Jehan F.; and Bogri, Tibor, 4,130,649, Cl. 424-266.000.

Bohlmann, Orville R. Automatic livestock waterer. 4,130,090, Cl. 119-73.000.

Bohm, Ludwig, to Hoechst Aktiengesellschaft. Method for the quantitative analysis of Al-C- and Al-H- bonds in hydrocarbons. 4,130,396, Cl. 23-230.00M.

Bohrer, George J., to H. K. Porter Company, Inc. Asbestos free friction element. 4,130,537, Cl. 260-38.000.

Bolen, Ralph A., to Sawyer, John, a part interest. Slot-head fastener and driver therefor. 4,130,152, Cl. 145-50.00D.

Bolgiano, Duane R.; Benjamin, Joel M., Jr.; and Meyer, Victor, Jr., to International Mobile Machines Incorporated. Portable telephone system. 4,130,731, Cl. 179-2.0EB.

Bolt Beranek and Newman Inc.: *See*—
Heart, Frank E.; Ornstein, Severo M.; Barker, William B.; and Crowther, William R., 4,130,865, Cl. 364-200.000.
Sher, Lawrence D., 4,130,832, Cl. 358-89.000.

Bombardieri, Caurino C., to Exxon Production Research Company. Method for recovering viscous hydrocarbons utilizing heated fluids. 4,130,163, Cl. 166-252.000.

Boos, Walter R.: *See*—
von Schmeling, Bogislav; and Boos, Walter R., 4,130,664, Cl. 424-330.000.

Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; by Prosvirova, Olga B., administrator; and by Zakharova, Irina B., administrator. Method of producing ethylene oxide. 4,130,570, Cl. 260-348.350.

Borg-Warner Corporation: *See*—
Jeffrey, Joseph O., 4,130,026, Cl. 74-245.00S.
Judd, Carl R.; and Snyder, Howard D., Jr., 4,130,191, Cl. 192-41.00A.
Moinuddin, Mohammed, 4,130,383, Cl. 418-78.000.
Paul, Howard C., 4,130,610, Cl. 261-36.00A.
Valdiserri, Leo L.; and Bullock, Elyse M., 4,130,540, Cl. 260-45.80R.

Borgianni, Carlo: *See*—
Marianeschi, Edmondo; Basevi, Sandro; Barisoni, Mario; Marini, Paolo; Borgianni, Carlo; and Ricci Bitti, Roberto, 4,130,447, Cl. 148-27.000.

Bornstein, Leopold F., to Georgia-Pacific Corporation. Lignin-based composition board binder comprising a copolymer of a lignosulfonate, melamine and an aldehyde. 4,130,515, Cl. 260-17.500.

Borovikova, Sofia M.; Lurie, Evgeny V.; and Mikhailov, Valery F. Plastication arrangement in a machine for processing polymeric materials. 4,130,901, Cl. 366-163.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Schotten, Henno, 4,129,993, Cl. 62-156.000.

Bottom, Virgil E., to Tyco Crystal Products, Inc. Method of adjusting the frequency of a crystal resonator and reducing ageing effects. 4,130,771, Cl. 310-312.000.

Bottum, Edward W. Solar heating system component and control therefor. 4,130,110, Cl. 126-271.000.

Bouchard, Andre C.; Hall, Harold H., Jr.; Patton, Robert J.; and Sententes, Thomas J., to GTE Sylvania Incorporated. Flashlamp assembly for providing highly intense audible and visual signals. 4,130,082, Cl. 116-5.000.

Bouchard, Andre C.; and Hall, Harold H., Jr., to GTE Sylvania Incorporated. Activating mechanism for flashlamp article. 4,130,083, Cl. 116-114.500.

Boulanger, Claude; and Poinas, Christian, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Terminal equipment for a multiplex carrier current telephone system. 4,130,743, Cl. 179-170.200.

Bourgeois, Ronald D. Transfer system for conveyor systems. 4,130,193, Cl. 198-369.000.

Bousmar, Michel A. M. J.; and Christiaens, Michel J. P., to U.S. Philips

Corporation. Data receiver with synchronizing sequence detection circuit. 4,130,724, Cl. 178-69.100.
Bowers, William L.: *See—*
Bennett, Moreland P.; and Bowers, William L., 4,130,750, Cl. 219-78.150.
Bowler, Lauren L.; and Lahiff, John E., to General Motors Corporation. Fuel control system with calibration learning capability for motor vehicle internal combustion engine. 4,130,095, Cl. 123-32.0EE.
Bowman, Rodney V.; and Francis, Martin H., to NCR Corporation. System for operating volatile memory in normal and standby modes. 4,130,899, Cl. 365-222.000.
Boyd, Timothy M., to Marcole, Inc. Subtractive developer for lithographic plates. 4,130,425, Cl. 96-48.00R.
Braddyll, John R. G.; Aubrey, Joseph H.; Shaw, Ernest A.; and Palmer, Ian, to Vickers Shipbuilding Group Limited. Homogenization method. 4,130,366, Cl. 366-288.000.
Bradley, Cecil Earl: *See—*
Fiegehen, Allan G.; Houghton, Robert P.; Bradley, Cecil Earl; and Richenburg, Paul F., 4,130,788, Cl. 318-574.000.
Brand, Warren H., to Yarway Corporation. Attemperator. 4,130,611, Cl. 261-66.000.
Brandenstein, Manfred: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 4,130,286, Cl. 277-12.000.
Branston, David W., to Siemens Aktiengesellschaft. DC PDP with divided cathode. 4,130,778, Cl. 315-169.0TV.
Braunsperger, Johann; Lang, Winfried; and Zainer, Thorgard, to Wacker-Chemitronic Gesellschaft fur Elecktronik-Grundstoffe mbH. Process for the manufacture of trichlorosilane and silicon tetrachloride. 4,130,632, Cl. 423-342.000.
Bray, Walter J.: *See—*
Batley, William R., Jr.; and Bray, Walter J., 4,130,553, Cl. 260-112.00R.
Breen, Barry C., to Melco. Two-link intercom system. 4,130,737, Cl. 179-18.0AD.
Brescia, Riccardo: *See—*
Conta, Renato; Montanari, Lucio; and Brescia, Riccardo, 4,130,752, Cl. 219-216.000.
Breuer, Friedrich; Duderstadt, Gunter; Dresler, Werner; Fichte, Rudolf; Kunert, Peter; and Nassauer, Gerd, to GfE Gesellschaft fur Elektrometallurgie mit beschrankter Haftung. Process for refining high-carbon ferro-alloys. 4,130,417, Cl. 75-60.000.
Breznak, Robert A.; and Parker, James A., to Celanese Corporation. Splice for use during the thermal stabilization of a flat multifilament band of an acrylic fibrous material comprising at least two segments. 4,130,679, Cl. 428-58.000.
Bricker, Norman C. Chain saw bar tightener. 4,129,943, Cl. 30-386.000.
Bridger, Robert F.; and Schmitt, Kirk D., to Mobil Oil Corporation. Process of preparing monoaryl phosphonates and lubricant compositions containing same. 4,130,496, Cl. 252-49.800.
Bridges, James R.; Riedesel, Roland G., Jr.; and Thompson, Larry W., to Texaco Inc. Dielectric well logging means and method utilizing the signals from a pair of receivers for providing clock pulses corresponding to earth formation dielectric constant. 4,130,793, Cl. 324-6.000.
Bridwell, Phillip P. Energy generating system for a roadway or railway. 4,130,064, Cl. 104-154.000.
Brillhart, Bruce A.: *See—*
Horne, Merton A.; and Brillhart, Bruce A., 4,130,897, Cl. 365-205.000.
British Columbia Research Council: *See—*
Oehr, Klaus H., 4,130,467, Cl. 204-57.000.
Brkic, Ferdo, to Adams Rite Manufacturing Co. Exit door locking mechanism having multiple bolts. 4,130,306, Cl. 292-5.000.
Broacha, Firoze H.: *See—*
Sivachenko, Eugene W.; and Broacha, Firoze H., 4,129,917, Cl. 14-73.000.
Brooks, Norman: *See—*
Cook, Alan J.; Brooks, Norman; and Kirkby, Anthony D., 4,130,150, Cl. 144-2.00R.
Broshears, Robert W. Device for measuring friction and distance. 4,130,008, Cl. 73-9.000.
Brower, Boyd G., to GTE Sylvania Incorporated. Multilamp photoflash unit. 4,130,857, Cl. 362-10.000.
Brown, Carl F., Jr. Gauge and method for determining the number of words per printed page. 4,129,947, Cl. 33-1.00B.
Brown, John V.: *See—*
Ebbert, Robert J.; and Brown, John V., 4,130,006, Cl. 72-391.000.
Brown, Lorin B. Combined nail file and writing implement clip attachment. 4,129,925, Cl. 24-11.0CC.
Brown, Ralph E. Method and portable apparatus for treating asphalt paving material. 4,130,364, Cl. 366-4.000.
Brown & Sharpe Manufacturing Company: *See—*
Callaghan, Robert P., Jr., 4,129,949, Cl. 33-169.00R.
Bruchet, Michel, to UNELEC S.A. Interchangeable tripping device for a circuit-breaker. 4,130,814, Cl. 335-42.000.
Brudnicki, Myron J., to Garrett Corporation, The. Pneumatic autoschedule cabin pressure controller. 4,130,051, Cl. 98-1.500.
Brueck, Chris M. Solar energy concentrator. 4,130,109, Cl. 126-271.000.
Bruns, Klaus: *See—*
Conrad, Jens; Bruns, Klaus; and Meins, Peter, 4,130,509, Cl. 252-522.000.
Bryson, John D., to Will Ross, Inc. Liquid dispensing package. 4,130,245, Cl. 239-34.000.
Buccicone, Velio S., to Bucciconi Engineering Co., Inc. Sheet piling machine with classifier and multiple piling arrangements. 4,130,206, Cl. 214-6.00D.
Bucciconi Engineering Co., Inc.: *See—*
Buccicone, Velio S., 4,130,206, Cl. 214-6.00D.
Buck, Robert T.: *See—*
Amos, Lynn G.; Banks, Howard F.; Buck, Robert T.; and Eppes, William R., 4,130,824, Cl. 346-33.00A.
Budecker, Ludwig; and David, Anton, to ITT Industries, Inc. Accumulator changing valve. 4,130,127, Cl. 137-101.000.
Bula, John; and Patrawala, Ashok C., to International Business Machines Corporation. Low power true/complement driver. 4,130,768, Cl. 307-270.000.
Bullock, Elyse M.: *See—*
Valdiserri, Leo L.; and Bullock, Elyse M., 4,130,540, Cl. 260-45.80R.
Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-PGF sulfonylamides. 4,130,584, Cl. 260-556.00A.
Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-PGF-p-substituted phenyl esters. 4,130,720, Cl. 560-61.000.
Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. 11-Deoxy PGE_2 compounds. 4,130,721, Cl. 560-121.000.
Bunker Ramo Corporation: *See—*
Spaulding, Tedford H., 4,130,327, Cl. 339-17.0CF.
Burge, Edward V., to Hawn, Richard Dean, Jr. Drill string shock absorber. 4,130,000, Cl. 64-1.00V.
Burley, Joseph W.: *See—*
Hutton, Ronald E.; and Burley, Joseph W., 4,130,573, Cl. 260-429.700.
Burns, Donald L.: *See—*
Becker, Roger T.; Burns, Donald L.; and Calkins, Stephen P., 4,130,195, Cl. 198-739.000.
Burroughs Corporation: *See—*
Steckowich, John, Jr., 4,130,262, Cl. 248-226.100.
C. Hoegger & Cie. AG.: *See—*
Hoegger, Cornel, 4,129,923, Cl. 17-33.000.
Calkins, Stephen P.: *See—*
Becker, Roger T.; Burns, Donald L.; and Calkins, Stephen P., 4,130,195, Cl. 198-739.000.
Call, Tracey G.: *See—*
Wight, Hewitt G.; Call, Tracey G.; and Mortensen, Marvin L., 4,130,578, Cl. 260-455.00A.
Callaghan, Robert P., Jr., to Brown & Sharpe Manufacturing Company. Height gage. 4,129,949, Cl. 33-169.00R.
Calundann, Gordon W., to Celanese Corporation. Melt processable thermotropic wholly aromatic polyester comprising both para-oxybenzoyl and meta-oxybenzoyl moieties. 4,130,545, Cl. 260-40.00P.
Cameron, Daniel F.; Hughes, Gary C.; and Janssen, Harry R., to Continental Oil Company. Process for making premium coke. 4,130,475, Cl. 208-54.000.
Cameron Iron Works, Inc.: *See—*
Jones, Marvin R., 4,130,161, Cl. 166-337.000.
Cameron, Vernon T. Cork cleaning formula. 4,130,499, Cl. 252-153.000.
Campbell, Kenneth C.: *See—*
Swanstrom, H. Wallace; Campbell, Kenneth C.; and Linford, Robin F. G., 4,130,882, Cl. 364-900.000.
Campbell, Maxwell S. Apparatus for manufacturing helical coils. 4,130,003, Cl. 72-133.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Courtenay, Terence H., 4,130,360, Cl. 356-4.000.
Canadian Industries Limited: *See—*
Craig, Joseph F. M., 4,130,449, Cl. 149-62.000.
Canard, Pierre; and Levy, Albert, to Rhone Poulenc Industries. Chemical composition. 4,130,691, Cl. 428-511.000.
Canon Kabushiki Kaisha: *See—*
Karube, Yukuo, 4,130,769, Cl. 310-46.000.
Kawamura, Naoto; Matsumoto, Kazuya; and Kitamura, Takashi, 4,130,339, Cl. 350-6.800.
Ohtaki, Shohei; Nakamoto, Soichi; Iwashita, Tomonori; Watanabe, Yoshiaki; and Kozuki, Susumu, 4,130,355, Cl. 354-33.000.
Canon Seiki Kabushiki Kaisha: *See—*
Karube, Yukuo, 4,130,769, Cl. 310-46.000.
Carborundum Company, The: *See—*
Hamilton, Robert S., 4,130,631, Cl. 423-290.000.
Careglio, Giuseppe; and Proietti, Giovanni, to WABCO Westinghouse. Fluorescent lamp support assemblage with built-in converter for the lighting of vehicles. 4,130,860, Cl. 362-217.000.
Carl Zeiss Stiftung: *See—*
Lang, Rudolf; and Schwarz, Gerhard, 4,130,358, Cl. 354-289.000.
Carlson, Floyd W.; and Mashman, Joseph, to Textron Inc. Helicopter collective lever. 4,130,259, Cl. 244-83.00F.
Carlsson, Stig T.; Rasmusson, Bo M.; and Scuka, Viktor, to Telefonaktiebolaget L M Ericsson. Laying tool for laying of submarine cables into a sea-bottom. 4,129,992, Cl. 405-164.000.
Carrigan, Eugene F., to Jeffboat, Incorporated. Removal of propellers from tapered shafts. 4,129,931, Cl. 29-252.000.
Carter, William A.: *See—*
Ts'o, Paul O. P.; and Carter, William A., 4,130,641, Cl. 424-85.000.
Castle, Harold J., to Morgen Manufacturing Company. Material conveying apparatus. 4,130,134, Cl. 137-615.000.
Caterpillar Tractor Co.: *See—*
Bailey, John M.; and Scott, Ronald K., 4,130,013, Cl. 73-119.00A.
Dawson, Dennis E., 4,130,025, Cl. 74-53.000.
Finley, Lloyd D.; and Kusper, Leroy F., 4,130,049, Cl. 91-445.000.
Olson, Harris S., 4,129,952, Cl. 37-118.00R.

Cavazza, Claudio, to Sigma Tau S.p.A. Industrie Farmaceutiche Riunite. Pocket inhalator. 4,130,116, Cl. 128-203.000.

Celanese Corporation: *See—*
Breznak, Robert A.; and Parker, James A., 4,130,679, Cl. 428-58.000.
Calundann, Gordon W., 4,130,545, Cl. 260-40.00P.
Choe, Eui W., 4,130,702, Cl. 526-93.000.
Edelman, Robert, 4,130,604, Cl. 260-860.000.
Rybny, Charles B.; and Levine, Eli, 4,130,518, Cl. 260-22.0CB.

Celotex Corporation, The: *See—*
Sherman, Morton; and Berry, James A., 4,129,972, Cl. 52-303.000.

Centro Sperimentale Metallurgico S.p.A.: *See—*
Marianeschi, Edmondo; Basevi, Sandro; Barisoni, Mario; Marini, Paolo; Borgianni, Carlo; and Ricci Bitti, Roberto, 4,130,447, Cl. 148-27.000.

Cerefice, Steven A.; Fields, Ellis K.; Marchant, Kerford A., Jr.; and Paschke, Edward E., to Standard Oil Company (Indiana). Method of making high purity monomers from dicarboxylic acid monoesters and resultant polymers. 4,130,719, Cl. 528-305.000.

Cerny, Ronald N.; Peters, Walter B.; Sadler, Thomas H.; Rodrigo, Peter; and Mollick, George M., to Johns-Manville Corporation. Heat insulated conduit especially suitable for carrying high temperature fluids. 4,130,140, Cl. 138-149.000.

Ceskoslovenska akademie ved: *See—*
Sevcik, Stanislav; Trekoval, Jiri; Holata, Jan; and Stamberg, Jiri, 4,130,705, Cl. 526-230.000.

Chakravarti, Kalidas: *See—*
Lazarus, Stanley D.; and Chakravarti, Kalidas, 4,130,541, Cl. 260-45.80A.

Chambers, Charles W., Jr.; Kiko, Frederick J.; and Kretschmann, Robert J., to Lorain Products Corporation. Loop extender. 4,130,735, Cl. 179-16.00F.

Champion International Corporation: *See—*
Sorenson, John F., 4,130,199, Cl. 206-320.000.

Champlin, Charles L.; and Misura, John T., to Packaging Corporation of America. Carrier for receptacles and blank therefor. 4,130,202, Cl. 206-434.000.

Chandler, Curtis S.; and Miller, Ralph L., to AMP Incorporated. Electrical connector assembly retention system. 4,130,329, Cl. 339-75.00M.

Chandler, Curtis S., to AMP Incorporated. Electrical connector strain relief and cover retention system. 4,130,330, Cl. 339-75.00M.

Chang, Eugene Y. C.; and Kaizerman, Samuel, to American Cyanamid Company. Polyurethanes stabilized against ultraviolet light and nitrogen oxide deterioration. 4,130,542, Cl. 260-45.9KB.

Charbonnages de France: *See—*
Valantin, Alfred, 4,129,990, Cl. 405-299.000.

Chase, Lee M.; and Muray, Julius J., to FMC Corporation. Maintaining optimum settling rate of activated sludge. 4,130,481, Cl. 210-6.000.

Chastant, Marc; and Riboud, Paul-Victor, to Institut de Recherches de la Siderurgie Francaise (Irsid). Pulverulent composition for forming protective layer on steel melts. 4,130,423, Cl. 75-257.000.

Chazan, Dan, heir: *See—*
Chazan, Reuwen R, deceased; Chazan, Dan, heir; Chazan, David Y., heir; and Fischer, Eliezer Z., 4,130,640, Cl. 424-80.000.

Chazan, David Y., heir: *See—*
Chazan, Reuwen R, deceased; Chazan, Dan, heir; Chazan, David Y., heir; and Fischer, Eliezer Z., 4,130,640, Cl. 424-80.000.

Chazan, Reuwen R, deceased; Chazan, Dan, heir; Chazan, David Y., heir; and Fischer, Eliezer Z. Germicidal cleaning compositions. 4,130,640, Cl. 424-80.000.

Chemetron Corporation: *See—*
George, Henry H., 4,130,303, Cl. 285-137.00R.

Chemie Linz Aktiengesellschaft: *See—*
Stern, Gerhard; and Wegleitner, Karlheinz, 4,130,697, Cl. 521-106.000.

Chen, Mark C., to Du Pont de Nemours, E. I., and Company. Carboxylated neoprene latex containing alkali-pretreated zinc oxide or hydroxide. 4,130,528, Cl. 260-29.7WA.

Chen, Meng-Hsiu: *See—*
Wang, John L.; Pickus, Milton R.; and Chen, Meng-Hsiu, 4,130,422, Cl. 75-246.000.

Cheng, David: *See—*
Urbach, John C.; and Cheng, David, 4,130,898, Cl. 365-215.000.

Cherry, Harvey A. Method and apparatus for continuous frequency measurement. 4,130,799, Cl. 324-79.00D.

Chesnokov, Boris B.: *See—*
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.

Chevron Research Company: *See—*
Katsumoto, Kiyoshi; and Nimer, Edward L., 4,130,521, Cl. 528-326.000.

Chikovani, Nordari M.: *See—*
Smolko, Gennady G.; Vasiliev, Gennady F.; and Chikovani, Nordari M., 4,130,855, Cl. 361-387.000.

Chisholm, John. Process for making porous metal heat sink from clad aluminum wire. 4,130,233, Cl. 228-126.000.

Chocholaty, Warren L.; Evans, Robert K.; and Perry, Francis J., to International Business Machines Corporation. Ink maintenance sensor. 4,130,126, Cl. 137-3.000.

Choe, Eui W., to Celanese Corporation. Polyacryloylaminobenzoic acid, polymethacryloylaminobenzoic acid and method of preparation. 4,130,702, Cl. 526-93.000.

Cholet, Jacques, to Institut Francais du Petrole. Floating device connected to a ship, for towing a submerged member with a lateral shift thereof with respect to the ship route. 4,130,078, Cl. 114-244.000.

Cholod, Michael, to Rohm and Haas Company. Sodium ion removal from acetone cyanohydrin. 4,130,580, Cl. 260-465.600.

Chomet, Marc, to Teleglobe Pay-TV System, Inc. Pay television system. 4,130,833, Cl. 358-122.000.

Christiaens, Michel J. P.: *See—*
Bousmar, Michel A. M. J.; and Christiaens, Michel J. P., 4,130,724, Cl. 178-69.100.

Chrysler Corporation: *See—*
Crall, Frederick W.; and Tomczak, Lawrence W., 4,130,856, Cl. 361-415.000.

Chryssanthou, Chryssanthos P., to Beth Israel Medical Center. Process and apparatus for detection of specific biological factors by means of osmotic hemolysis. 4,130,395, Cl. 23-230.00B.

Chua, Hua-Thye, to Monolithic Memories, Inc. Programmable write-once, read-only semiconductor memory array using SCR current sink and current source devices. 4,130,889, Cl. 365-96.000.

Churchill, Arthur E., to Stanford, George A., a part interest. Adaptor and control system arrangement for converting multiple cylinder carburetor engines for split operation. 4,130,102, Cl. 123-198.00F.

Ciba-Geigy AG: *See—*
Lamb, Frank, 4,130,532, Cl. 260-31.600.
Lamb, Frank, 4,130,533, Cl. 260-31.600.
Lee, Frank; Allan, James; and Fearnley, Charles, 4,130,498, Cl. 252-99.000.
Wegmann, Jacques E., 4,130,539, Cl. 260-42.550.

Ciba-Geigy Corporation: *See—*
Andrews, Christopher M., 4,130,511, Cl. 528-92.000.
Cook, Barry, 4,130,710, Cl. 542-418.000.
Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, 4,130,655, Cl. 424-304.000.
Greuter, Hans; Martin, Pierre; Bellus, Daniel; Gsell, Laurenz; and Meyer, Willy, 4,130,656, Cl. 424-304.000.
Habermeier, Jurgen, 4,130,560, Cl. 544-302.000.
Haug, Theobald; Kiefer, Jurg; and Renner, Alfred, 4,130,564, Cl. 260-326.260.
Ilvespaa, Atso; and Fuhrer, Walter, 4,130,652, Cl. 424-274.000.
Petree, Harris E.; Myatt, Hal L.; and Jelenevsky, Alex M., 4,130,582, Cl. 562-448.000.
Wehner, Hermann W.; and Lorenz, Joachim, 4,130,432, Cl. 106-15.00R.
Zahir, Abdul-Cader; and Wyler, Siegfried, 4,130,600, Cl. 260-830.00P.

Cimiluca, Arthur: *See—*
Petersen, Arthur W.; Cimiluca, Arthur; and Hirschberger, Leonard, 4,130,442, Cl. 134-4.000.

Citizen Watch Company Limited: *See—*
Nomura, Yasushi; Nakajima, Fumio; Yamada, Kenji; and Machida, Takayasu, 4,129,981, Cl. 58-23.00D.

Clarion Co., Ltd.: *See—*
Mori, Masaharu; and Amazawa, Kiyoshi, 4,130,805, Cl. 325-473.000.

Clark, Allan E.: *See—*
Hill, William F.; and Clark, Allan E., 4,130,817, Cl. 340-58.000.

Clauss, Hermann: *See—*
Bachle, Erich; and Clauss, Hermann, 4,130,826, Cl. 357-34.000.

Clay, Burton R.; and Gore, Douglas A., to RCA Corporation. Hologram having expanded viewing area. 4,130,338, Cl. 350-3.820.

Cleveland Hardware and Forging Company: *See—*
Kessie, Lawrence R., 4,130,310, Cl. 292-340.000.

Cleveland, Joseph J.: *See—*
Dziedzic, Chester J.; and Cleveland, Joseph J., 4,130,160, Cl. 165-166.000.

Clevett, Merton L.; and Clevett, Mildred L. Solar stove. 4,130,106, Cl. 126-270.000.

Clevett, Mildred L.: *See—*
Clevett, Merton L.; and Clevett, Mildred L., 4,130,106, Cl. 126-270.000.

Clifford, David F., to Ansell Jones & Company Ltd. Lifting devices. 4,130,313, Cl. 294-83.00R.

Clifford, Michael L., to Imperial Chemical Industries Limited. Tubular extrudate. 4,130,616, Cl. 264-514.000.

Coady, A. B.: *See—*
Cooley, T. E.; and Coady, A. B., 4,130,403, Cl. 55-16.000.

Coal Industry (Patents) Limited: *See—*
Gapper, Terence J., 4,130,319, Cl. 299-1.000.

Cockram, Frederick T.: *See—*
Zajac, Chester S.; Cockram, Frederick T.; and Thompson, Scott B., 4,130,289, Cl. 279-1.00A.

Cogan, Fredrick T., to Northern Telecom Limited. Telephone handset with rotatably locking receiver. 4,130,740, Cl. 179-103.000.

Cogswell, John A.; Klaszky, Fred E.; and Jacobs, Anthony S., to Wessel Company, Inc., The. Apparatus for stacking booklets from the top. 4,130,207, Cl. 214-6.00D.

Cohen, Leon E.: *See—*
Lutz, Charles W.; and Cohen, Leon E., 4,130,501, Cl. 252-186.000.

Colgate-Palmolive Company: *See—*
Bauman, Robert A., 4,130,637, Cl. 124-54.000.
Fox, Lester A., 4,130,393, Cl. 422-31.000.
Tomlinson, Kenneth, 4,130,636, Cl. 424-52.000.

Collier, Owen N.; and Hackett, Stephen J., to Johnson, Matthey & Co., Limited. Metal powders. 4,130,506, Cl. 252-438.000.

Collins, Thomas W.: *See—*
Schweitzer, Paul H.; and Collins, Thomas W., 4,130,863, Cl. 364-105.000.
Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D., 4,130,269, Cl. 254-67.000.
Comer, Robert C., to Toro Company, The. Low speed rotary mower. 4,129,977, Cl. 56-13.400.
Comer, William T.: *See—*
Matier, William L.; and Comer, William T., 4,130,663, Cl. 424-326.000.
Comfort Lines, Inc.: *See—*
Rossi, Joseph V., 4,130,316, Cl. 297-46.000.
Communications Satellite Corporation: *See—*
Snyder, John S., Jr., 4,130,818, Cl. 340-146.1AQ.
Compagnie Industrielle des Piles Electriques "Cipel" S.A.: *See—*
Battarel, Alain, 4,130,859, Cl. 362-205.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Boulanger, Claude; and Poinas, Christian, 4,130,743, Cl. 179-170.200.
Lemonde, Jean-Louis, 4,130,344, Cl. 350-96.210.
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. 8-Methoxypsoralen derivatives. 4,130,568, Cl. 260-343.210.
Conibear, Frank R., to Woodstream Corporation. Omni-directional trigger mechanism for animal traps. 4,129,958, Cl. 43-92.000.
Conrad, Jens; Bruns, Klaus; and Meins, Peter, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Perfume compositions containing cis- and trans-trimethylcyclohexylethyl ethers. 4,130,509, Cl. 252-522.000.
Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Method of inhibiting the complement system with trisubstituted naphthalene compounds. 4,130,660, Cl. 424-319.000.
Conroy, Peter J., to Motorola, Inc. Slot antenna. 4,130,822, Cl. 343-700.0MS.
Consolidated Foods Corporation: *See—*
Evans, Robert A.; and Momberg, James W., 4,129,920, Cl. 15-337.000.
Conta, Renato; Montanari, Lucio; and Brescia, Riccardo, to Ing. C. Olivetti & C., S.p.A. Electrothermal print head. 4,130,752, Cl. 219-216.000.
Continental Group, Inc., The: *See—*
Mallorca, Salvador C., 4,130,219, Cl. 220-270.000.
Walter, John, 4,130,218, Cl. 220-268.000.
Continental Instrument Corporation: *See—*
Mannion, Robert S., 4,130,242, Cl. 235-450.000.
Continental Oil Company: *See—*
Cameron, Daniel F.; Hughes, Gary C.; and Janssen, Harry R., 4,130,475, Cl. 208-54.000.
Conwed Corporation: *See—*
Niemi, Ilmer I.; and Peterson, Kenneth S., 4,129,989, Cl. 405-70.000.
Cook, Alan J.; Brooks, Norman; and Kirkby, Anthony D., to Cook Bolinders Limited. Finger jointing machine. 4,130,150, Cl. 144-2.00R.
Cook, Barry, to Ciba-Geigy Corporation. Piperidine derivatives. 4,130,710, Cl. 542-418.000.
Cook Bolinders Limited: *See—*
Cook, Alan J.; Brooks, Norman; and Kirkby, Anthony D., 4,130,150, Cl. 144-2.00R.
Cook, Robert D., to Crane Co. Single gain skid control valve and skid control system. 4,130,322, Cl. 303-93.000.
Cooke, Richard C., Jr.: *See—*
Merrill, Duane F.; and Cooke, Richard C., Jr., 4,130,599, Cl. 260-825.000.
Cooksey, James M., to Vought Corporation. Apparatus and method for reducing flow disturbances in a flowing stream of compressible fluid. 4,130,173, Cl. 181-212.000.
Cookson Company, The: *See—*
Wardlaw, Russell, 4,130,156, Cl. 160-9.000.
Cooley, T. E.; and Coady, A. B. Removal of H_2S and/or CO_2 from a light hydrocarbon stream by use of gas permeable membrane. 4,130,403, Cl. 55-16.000.
Cooper, Robert L., Sr. Sectioned breakable vehicular safety bumper. 4,130,312, Cl. 293-76.000.
Copenhaver, Henry A. Mulcher attachment for cultivator. 4,130,820, Cl. 172-707.000.
Coran, Aubert Y.; and Patel, Raman P., to Monsanto Company. Elastoplastic compositions of butyl rubber and polyolefin resin. 4,130,534, Cl. 260-33.6AQ.
Coran, Aubert Y.; Das, Balbhadra; and Patel, Raman P., to Monsanto Company. Thermoplastic vulcanizates of olefin rubber and polyolefin resin. 4,130,535, Cl. 260-33.6AQ.
Corcoran, Thomas M.: *See—*
Goodrich, Albert S.; and Corcoran, Thomas M., 4,130,022, Cl. 73-633.000.
Corey, Joe F.; and Corey, Tony G. No spill beverage cup. 4,130,215, Cl. 220-90.400.
Corey, Tony G.: *See—*
Corey, Joe F.; and Corey, Tony G., 4,130,215, Cl. 220-90.400.
Corning Glass Works: *See—*
Amos, Lynn G.; Banks, Howard F.; Buck, Robert T.; and Eppes, William R., 4,130,824, Cl. 346-33.00A.
Ference, Joseph; and Megles, John E., Jr., 4,130,680, Cl. 428-68.000.
Mazeau, Jean P.; and Seward, Thomas P., III, 4,130,437, Cl. 106-54.000.
Cortex Research Corporation: *See—*
Fosslien, Egil, 4,130,754, Cl. 235-92.0PC.
Cosco, Robert J.; Kokinos, Charles C., Jr.; and Geleski, Charles J., to GTE Sylvania Incorporated. Flash tube having improved end cap construction. 4,130,774, Cl. 313-318.000.
Costa, Eugene, Jr., to International Paper Company. Production of high strength hollow rayon fibers. 4,130,689, Cl. 428-398.000.
Cote, Anthony J., to E. H. Price Limited. Constant volume regulator with adjustable load means. 4,130,132, Cl. 137-512.150.
Couchot, Carl A.: *See—*
Rajput, Yudh V.; and Couchot, Carl A., 4,130,323, Cl. 303-106.000.
Courtenay, Terence H., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Laser altimeter/-profilometer apparatus. 4,130,360, Cl. 356-4.000.
Cox, C. Eugene. Methods and means for identifying and testing circuit connections. 4,130,794, Cl. 324-51.000.
Craig, Joseph F. M., to Canadian Industries Limited. Thickened aqueous slurry explosive compositions. 4,130,449, Cl. 149-62.000.
Crall, Frederick W.; and Tomczak, Lawrence W., to Chrysler Corporation. Housing for mounting electronic circuit boards on an engine air filter housing. 4,130,856, Cl. 361-415.000.
Crane Co.: *See—*
Cook, Robert D., 4,130,322, Cl. 303-93.000.
Creith, Lou C., to Altech Industries, Inc. Peripheral seal for floating roofs. 4,130,216, Cl. 220-224.000.
Cronin, John C.; and Schuetz, Willy, to Gould Inc. High speed fault diverter switch for gas-insulated systems. 4,130,850, Cl. 361-54.000.
Crosby Valve & Gage Company: *See—*
Stewart, Robert D.; and Schretter, James A., 4,130,130, Cl. 137-475.000.
Cross, Barrington; and Dawe, David H., to American Cyanamid Company. Fungicidal phenylnitramines and new phenylnitramines. 4,130,645, Cl. 424-226.000.
Crossland, William A.; and Morrissy, Joseph H., to International Standard Electric Corporation. Method of forming large liquid crystal cells. 4,130,408, Cl. 65-43.000.
Crowther, William R.: *See—*
Heart, Frank E.; Ornstein, Severo M.; Barker, William B.; and Crowther, William R., 4,130,865, Cl. 364-200.000.
Cudzik, Daniel F., to Reynolds Metals Company. Tab system. 4,130,074, Cl. 113-121.00R.
Cullison, David A.: *See—*
Vogt, B. Richard; and Cullison, David A., 4,130,646, Cl. 424-250.000.
Cundy, Colin S.: *See—*
Ballard, Denis G. H.; Cundy, Colin S.; and Rideal, Graham R., 4,130,687, Cl. 428-310.000.
Curry, Charles D. B.: *See—*
Reins, Edward R.; and Curry, Charles D. B., 4,130,887, Cl. 364-900.000.
Cushing, David E., to Honeywell Information Systems Inc. Apparatus for performing floating point arithmetic operations using submultiple storage. 4,130,879, Cl. 364-748.000.
Dainippon Ink and Chemicals, Inc.: *See—*
Ohoka, Masataka; Yamada, Mitsuko; Shoji, Akio; and Arimoto, Shunji, 4,130,601, Cl. 260-835.000.
Daley, Thomas G. Method of making a molded support for an object using a self-closing valve. 4,129,935, Cl. 29-460.000.
D'Altroy, Frederick A.; Hartman, Adrian R.; Jacobs, Richard M.; Pritchett, Robert L.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. Integrated circuit switching network using low substrate leakage current thyristor construction. 4,130,827, Cl. 357-38.000.
Dame, James M.: *See—*
Giandomenico, Anthony; Dame, James M.; and Behimer, Harold, 4,130,032, Cl. 81-119.000.
D'Antonio, Nicholas F.; and Bates, Richard L., to Kinetronic Industries. Ski-binding. 4,130,296, Cl. 280-612.000.
Darlington, Douglas K.: *See—*
Smart, William L.; Hoenig, Stuart A.; Savitz, Christian W.; and Darlington, Douglas K., 4,129,966, Cl. 51-170.00T.
Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe or logic circuit. 4,130,764, Cl. 307-218.000.
Dart Industries Inc.: *See—*
Elias, Moenes L.; and Good, Millard F., 4,130,455, Cl. 156-666.000.
Das, Balbhadra: *See—*
Coran, Aubert Y.; Das, Balbhadra; and Patel, Raman P., 4,130,535, Cl. 260-33.6AQ.
Data Motion Incorporated: *See—*
Seitz, Alan F., 4,130,230, Cl. 226-75.000.
Datta, Rabinder S., to Syracuse Research Corporation. Process for coal gasification. 4,130,164, Cl. 166-259.000.
David, Anton: *See—*
Budecker, Ludwig; and David, Anton, 4,130,127, Cl. 137-101.000.
Davis, Donald A. Hitch assembly for a farm tractor. 4,130,295, Cl. 280-412.000.
Davydov, Valery A.: *See—*
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.
Dawe, David H.: *See—*
Cross, Barrington; and Dawe, David H., 4,130,645, Cl. 424-226.000.

Dawson, Dennis E., to Caterpillar Tractor Co. Control linkage for converting alternating rotary motion into unidirectional motion. 4,130,025, Cl. 74-53.000.
Dayco Corporation: *See*—
Haren, Doyle V., 4,130,139, Cl. 138-125.000.
Tell, Mayo B., 4,130,142, Cl. 139-159.000.
de la Cruz, Virgil. Mercury switch arrangement for digital watch. 4,129,982, Cl. 58-23.00R.
Deavin, Lynda: *See*—
Righelato, Renton C.; and Deavin, Lynda, 4,130,461, Cl. 195-31.00P.
Decker, Joseph A., Jr.; Amin, Bipinchandra; and Magruder, William R., to Igloo Corporation. Method for making an insulated container having a shock-resistant bottom. 4,130,615, Cl. 264-46.500.
Dedolph, Richard R., to Gravi-Mechanics Co. Field transplant systems and methods and components thereof. 4,130,072, Cl. 111-2.000.
de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Ribbed brake shoe support plate for cylindrical ring type brake. 4,130,186, Cl. 188-76.000.
Deike, Robert F., to Foresight Industries. Downcrowding boom assembly. 4,130,168, Cl. 173-38.000.
De Jule, Michael C., to Zenith Radio Corporation. Scanning means and method for a plasma-sac-type gas-discharge image display panel. 4,130,777, Cl. 315-169.0TV.
Delpla, Claude: *See*—
Garnier, Regis; and Delpla, Claude, 4,130,136, Cl. 137-625.410.
De Marco, Franco; and Panzeri, Constantino, to Societa Italiana Telecomunicazioni Siemens S.P.A. Telecommunication system with keyboard selection. 4,130,736, Cl. 179-16.0EC.
den Hollander, Willem, to RCA Corporation. Side pincushion correction circuit with low dissipation damping. 4,130,783, Cl. 315-371.000.
Denison, Early B., to Shell Oil Company. Downhole connector for use with drill string telemetering system. 4,130,169, Cl. 175-299.000.
Denizman, Nejat H. Shaving implement. 4,129,942, Cl. 30-41.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Kadowaki, Takashi; Nishimura, Michio; Watanabe, Seiichi; and Abe, Koichi, 4,130,596, Cl. 260-655.000.
Dennis, Jack B., to Massachusetts Institute of Technology. Packet memory system for processing many independent memory transactions concurrently. 4,130,885, Cl. 364-900.000.
De Nora, Oronzio; and De Nora, Vittorio, to Oronzio de Nora Impianti Elettrochimici S.p.A. Method of operation of an electrolysis cell with vertical anodes and cathodes. 4,130,468, Cl. 204-98.000.
De Nora, Vittorio: *See*—
De Nora, Oronzio; and De Nora, Vittorio, 4,130,468, Cl. 204-98.000.
Densmore, Russell A., to Kaiser Aluminum & Chemical Corporation. Pole vibration damper. 4,130,185, Cl. 188-1.00B.
Derickson, Richard B., to Atari, Inc. Method and apparatus for homogeneous exposure of video display screen. 4,130,830, Cl. 358-22.000.
Design Loft Creations, Inc.: *See*—
Lockerby, Charles E.; and Dimmick, W. Scott, 4,130,012, Cl. 73-73.000.
Desmond, Timothy F.: *See*—
Anderson, George J.; Desmond, Timothy F.; and Santer, J. Owen, 4,130,692, Cl. 428-524.000.
Dethlefsen, Rolf, to Gould Inc. High voltage d-c vacuum interrupter device with magnetic control of interrupter impedance with movable contact. 4,130,781, Cl. 315-331.000.
Dethlefsen, Rolf, to Gould Inc. High voltage d-c vacuum interrupter device with magnetic control of interrupter impedance. 4,130,782, Cl. 315-335.000.
Detrex Chemical Industries, Inc.: *See*—
Roberts, Wilbert J.; and Weissman, Gerald R., 4,130,674, Cl. 427-331.000.
De Winter, Walter F.: *See*—
Gilliams, Yvan K.; De Winter, Walter F.; Van Paesschen, August J.; and Timmerman, Daniel M., 4,130,670, Cl. 427-16.000.
DeWoskin, Irvin S., to Orthoband Company, Inc. Strapping for orthodontic headgear and other uses. 4,130,681, Cl. 428-102.000.
Dhabhar, Dadi J.; Heyd, Allen; and Gans, Eugene H., to Richardson-Merrell Inc. Mouthwash compositions. 4,130,638, Cl. 424-55.000.
Diamond Die & Mold Co.: *See*—
Baldyga, Joseph W., 4,129,939, Cl. 29-625.000.
Diamond International Corporation: *See*—
Struble, Glenn E., 4,130,237, Cl. 229-40.000.
Dibrov, Gennady D.: *See*—
Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Khlopkov, Leonid P.; Nesterovsky, Sergei G.; Starun, Andrei I.; Mironov, Viktor D.; Dibrov, Gennady D.; and Panasenko, Anatoly A., 4,130,439, Cl. 106-67.000.
Didier Engineering GmbH: *See*—
Blase, Manfred, 4,130,244, Cl. 238-24.000.
Didier-Werke A.G.: *See*—
Boggum, Paul; and Schulte, Klaus, 4,130,391, Cl. 432-264.000.
Diederen, Willi: *See*—
Muller, Erich; Diederen, Willi; and Shanks, Robin G., 4,130,650, Cl. 424-263.000.
Diehl, Francis L.; and Edwards, James B., to Procter & Gamble Company, The. Bleaching process. 4,130,392, Cl. 8-101.000.
Dietsche, Robert J., to Westinghouse Electric Corp. Fan mounting arrangement. 4,130,376, Cl. 415-219.00C.
Dietz, Hermann; and Ziegler, Siegfried, to Robert Bosch GmbH. Lead-acid storage battery and electrode therefor. 4,130,695, Cl. 429-215.000.
Dietz, Richard E.: *See*—
Nasser, Benny E., Jr.; and Dietz, Richard E., 4,130,505, Cl. 252-432.000.
Dillon, Roy E., to Macfield Texturing, Inc. Friction discs for false-twist head. 4,129,980, Cl. 57-339.000.
Dimmick, W. Scott: *See*—
Lockerby, Charles E.; and Dimmick, W. Scott, 4,130,012, Cl. 73-73.000.
Display Corporation International: *See*—
Hornblad, Richard P., 4,130,326, Cl. 312-292.000.
Djurinec, Marijan, to Smith & Stone Limited. Quick connect electrical plug. 4,130,333, Cl. 339-97.00P.
DLM Inc.: *See*—
Eckert, Ronald P., 4,129,953, Cl. 40-156.000.
Doellner, O. Leonard, to Boeing Company, The. Optical coupling apparatus. 4,130,345, Cl. 350-96.220.
Don R. Hinderliter, Inc.: *See*—
Hebard, Harry D., 4,130,304, Cl. 285-143.000.
Donnelly, Charles W., Sr.; and Stauffer, Larry R., to AMP Incorporated. Cutter assembly. 4,130,040, Cl. 83-389.000.
Doorakian, George A.; and Duquette, Lawrence G., to Dow Chemical Company, The. Ar-cyclic sulfonium arenethiol salts and their zwitterions. 4,130,543, Cl. 528-125.000.
Dow Chemical Company, The: *See*—
Doorakian, George A.; and Duquette, Lawrence G., 4,130,543, Cl. 528-125.000.
Garner, Joseph L., 4,130,688, Cl. 428-342.000.
Martin, Alton E.; White, Warren D.; and Smolik, Samuel L., 4,130,588, Cl. 260-570.00D.
Meyer, Wilfred C., 4,130,400, Cl. 44-51.000.
Meyer, Wilfred C.; and Klimpel, Richard R., 4,130,401, Cl. 44-51.000.
Podobnik, Donald M.; and Harris, Guy H., 4,130,477, Cl. 209-166.000.
Ritzie, Robert H., 4,130,287, Cl. 277-12.000.
Shier, George D., 4,130,711, Cl. 544-385.000.
Walker, Lynn C., 4,130,016, Cl. 73-190.00R.
Dow, Ray A. Bag filling device. 4,130,261, Cl. 248-97.000.
Doyle, Francis J.: *See*—
Miller, Robert S.; and Doyle, Francis J., 4,130,527, Cl. 260-29.60R.
Dozier, Hilliard, to U.S. Terminals, Inc. Binding post terminal. 4,130,336, Cl. 339-273.00R.
Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, to Ciba-Geigy Corporation. Pesticidal 2,2-dimethyl-3-isobutyl-cyclopropionates. 4,130,655, Cl. 424-304.000.
Dragt, Jan C. W., to U.S. Philips Corporation. Method of manufacturing an electrically controllable pivoting mirror device. 4,129,930, Cl. 29-149.50R.
Draper, Homer L.: *See*—
Gagle, Duane W.; and Draper, Homer L., 4,130,516, Cl. 260-28.5AS.
Dray, Sheldon: *See*—
Molinaro, Giuseppe A.; and Dray, Sheldon, 4,130,634, Cl. 424-8.000.
Dresler, Werner: *See*—
Breuer, Friedrich; Duderstadt, Gunter; Dresler, Werner; Fichte, Rudolf; Kunert, Peter; and Nassauer, Gerd, 4,130,417, Cl. 75-60.000.
Dresser Industries, Inc.: *See*—
Stratienko, Andrew, 4,130,030, Cl. 74-625.000.
Driscoll, Michael M.: *See*—
Arakelian, Rafi; and Driscoll, Michael M., 4,130,765, Cl. 307-220.00R.
Druxeis, Rudolf, to Sandvik Aktiebolag. Cutting insert and rotary cutter tool. 4,130,371, Cl. 407-114.000.
Dubs, Paul; and Kuntzel, Heiner, to Givaudan Corporation. Odorant or flavoring thiazolyl disulphides. 4,130,562, Cl. 260-302.00S.
Duderstadt, Gunter: *See*—
Breuer, Friedrich; Duderstadt, Gunter; Dresler, Werner; Fichte, Rudolf; Kunert, Peter; and Nassauer, Gerd, 4,130,417, Cl. 75-60.000.
Duerr, Joseph W., to Ganz Brothers, Inc. Shrink wrap container package. 4,130,201, Cl. 206-432.000.
Dulin, Henry. Apparatus for cleaning roller applicators. 4,130,443, Cl. 134-33.000.
Dumont, Claude: *See*—
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,130,658, Cl. 424-308.000.
Dunham, Harry J.; and Hurd, Gordon P., to General Electric Company. Double-walled well casing structure. 4,130,301, Cl. 285-47.000.
Dunn, John W.: *See*—
Hendrix, Ronald W.; Klink, Jerome P.; and Dunn, John W., 4,130,248, Cl. 242-18.00G.
Dunn, Samuel G. Starting bar attachment for starting gates. 4,130,087, Cl. 119-15.50R.
Dunnrowicz, Clarence J.: *See*—
Sandy, Frank; and Dunnrowicz, Clarence J., 4,130,813, Cl. 333-72.000.
Dunster, Ronald A.; and Savage, John A. Visual level indicator. 4,130,146, Cl. 141-96.000.
Du Pont de Nemours, E. I., and Company: *See*—
Atkins, Thomas J., 4,130,715, Cl. 544-324.000.
Bellis, Harold E., 4,130,595, Cl. 260-654.00R.
Chen, Mark C., 4,130,528, Cl. 260-29.7WA.
Frazer, August H.; Harris, John F., Jr.; and Martin, Elmore L., 4,130,579, Cl. 260-465.00H.

Hall, Ira L., 4,130,435, Cl. 106-22.000.
Huntsberger, James R., 4,130,677, Cl. 427-379.000.
Plambeck, Louis, Jr., 4,130,706, Cl. 526-245.000.
Vassiliou, Eustathios; and Welch, Edward J., 4,130,675, Cl. 427-333.000.

Duquette, Lawrence G.: *See—*
Doorakian, George A.; and Duquette, Lawrence G., 4,130,543, Cl. 528-125.000.

Duraglass Research & Development Corp.: *See—*
Ida, Nobel, 4,130,407, Cl. 65-30.00E.

Dutkewych, Oleh B.; Gaputis, Charles A.; Gulla, Michael; and Levy, Leonard R. Etchant and process of etching with the same. 4,130,454, Cl. 156-659.000.

Dyer, Gerald T.; and Ryan, Michael A., to Polaroid Corporation. Novel filtration process and apparatus. 4,130,485, Cl. 210-66.000.

Dyment, Oskar N.: *See—*
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.

Dynamit Nobel Aktiengesellschaft: *See—*
Vogt, Wilhelm; and Richtzenhain, Herman, 4,130,592, Cl. 568-604.000.

Dynex/Rivett Inc.: *See—*
Heinrich, Allan E., 4,129,986, Cl. 60-327.000.

Dyroff, David R.; and Suchanek, Walton F., Jr., to Monsanto Company. Calculus inhibition. 4,130,635, Cl. 424-48.000.

Dziedzic, Chester J.; and Cleveland, Joseph J., to GTE Sylvania Incorporated. Composite ceramic cellular structure and heat recuperative apparatus incorporating same. 4,130,160, Cl. 165-166.000.

E. H. Price Limited: *See—*
Cote, Anthony J., 4,130,132, Cl. 137-512.150.

E. R. Squibb & Sons, Inc.: *See—*
Vogt, B. Richard; and Cullison, David A., 4,130,646, Cl. 424-250.000.

Eager, George S., Jr.: *See—*
Bahder, George; Eager, George S., Jr.; and Silver, David A., 4,130,450, Cl. 156-48.000.

Eastman Kodak Company: *See—*
Groner, Carl F., 4,130,359, Cl. 355-3.00P.
Peffer, Robert M.; Rehn, Albert H.; and Grose, Zacharie, 4,130,852, Cl. 361-213.000.

Eaton, Homer L., to Eaton-Leonard Corporation. Method for bending tubes. 4,130,004, Cl. 72-151.000.

Eaton-Leonard Corporation: *See—*
Eaton, Homer L., 4,130,004, Cl. 72-151.000.

Ebbert Engineering Company: *See—*
Ebbert, Robert J.; and Brown, John V., 4,130,006, Cl. 72-391.000.

Ebbert, Robert J.; and Brown, John V., to Ebbert Engineering Company. Riveting system. 4,130,006, Cl. 72-391.000.

Eckert, Ronald P., to DLM Inc. Poster frame and molding method. 4,129,953, Cl. 40-156.000.

Eddens, Gerald R., to W. J. Industries, Incorporated. Tension monitor means. 4,130,014, Cl. 73-144.000.

Eddleman, William L. Electrode structure for use in metal in exchange apparatus useful in purifying spent acids and the like. 4,130,473, Cl. 204-252.000.

Edelman, Robert, to Celanese Corporation. Production of an improved polyoxymethylene molding composition which forms reduced mold deposits upon molding. 4,130,604, Cl. 260-860.000.

Edw. C. Levy Co.: *See—*
Hauser, Karl V.; and Mencenberg, Fred, 4,130,436, Cl. 106-38.900.

Edwards, David V.; Lesh, Harvey B., Jr.; and Phillips, Ronald W., II, to B. F. Goodrich Company, The. Launching system for inflatable raft. 4,129,910, Cl. 9-42.000.

Edwards, James B.: *See—*
Diehl, Francis L.; and Edwards, James B., 4,130,392, Cl. 8-101.000.

Edwards, Roderick I.: *See—*
Evers, Ann P.; Edwards, Roderick I.; and Fieberg, Monika M., 4,130,625, Cl. 423-22.000.

Efimov, Vladimir E.: *See—*
Zaboronok, Georgy F.; Efimov, Vladimir E.; and Kozlov, Alexandr T., 4,130,416, Cl. 75-10.00R.

Eibofner, Eugen, to Kaltenbach & Voigt GmbH & Co. Clamping device for dental handpiece. 4,129,945, Cl. 32-26.000.

Eichler, Horst. Side propellers for the propulsion of fast boats and aircraft. 4,130,378, Cl. 416-175.000.

Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, to Merck Patent Gesellschaft mit. Liquid crystalline cyclohexane derivatives. 4,130,502, Cl. 252-299.000.

Eisai Co., Ltd.: *See—*
Kijima, Shizumasa; Shionoya, Hiroshi; Hamamura, Kimio; Arai, Haruyoshi; and Koyanagi, Nozomu, 4,130,648, Cl. 424-251.000.
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,130,659, Cl. 424-312.000.

Ektelon: *See—*
Held, Franklin W., 4,130,619, Cl. 264-162.000.

Eli Lilly and Company: *See—*
Nagarajan, Ramakrishnan, 4,130,709, Cl. 536-17.000.

Elias, Moenes L.; and Good, Millard F., to Dart Industries Inc. Dissolution of metals-utilizing H_2O_2-H_2SO_4-thiosulfate etchant. 4,130,455, Cl. 156-666.000.

Elshtain, Errol L.: *See—*
Haessler, Herbert A.; Elshtain, Errol L.; and Holland, Taffy, 4,130,881, Cl. 364-900.000.

Emmie, George W. Flexible picket fence. 4,130,272, Cl. 256-22.000.

Energy Resources Company, Inc.: *See—*
Porter, James H., 4,130,071, Cl. 110-245.000.

Engel, Werner. Apparatus for the extraction of die-cast parts from the molds of die-casting machines. 4,130,246, Cl. 239-186.000.

Engelhart, John E.; and McNeil, Maynard W., to M&T Chemicals Inc. Compositions for regulating undesirable plant growth. 4,130,411, Cl. 71-86.000.

Engelmann, Heinz: *See—*
Susdorf, Roman; Schuler, Ulrich; and Engelmann, Heinz, 4,130,065, Cl. 105-135.000.

Engelmann, Rudolph H., to Seifried, Hildegarde; and Adams, John W. Optical character recognition device. 4,130,819, Cl. 340-146.3AC.

Enkoji, Takashi; and Skibbe, Martin O., to Armour Pharmaceutical Company. Synthesis of peptides. 4,130,514, Cl. 260-8.000.

Enomoto, Satoru: *See—*
Nakayama, Yasuharu; Watanabe, Tadashi; Nishida, Reiziro; and Enomoto, Satoru, 4,130,526, Cl. 260-29.6RB.
Nakayama, Yasuharu; Watanabe, Tadashi; Nishida, Reiziro; and Enomoto, Satoru, 4,130,529, Cl. 260-29.7UA.

Ensign Bickford Company: *See—*
Boggs, Brian F.; Zilcosky, Hector J.; and Smith, William M., 4,130,061, Cl. 102-66.000.

Envair, Inc.: *See—*
Norman, Richard O.; and Frassanito, John R., 4,130,224, Cl. 222-185.000.

Envirotech Corporation: *See—*
Adams, George L.; Aker, David; and Silvermetz, David, 4,130,018, Cl. 73-290.00V.
Klavir, Samuel N., 4,130,463, Cl. 202-263.000.

Eppes, William R.: *See—*
Amos, Lynn G.; Banks, Howard F.; Buck, Robert T.; and Eppes, William R., 4,130,824, Cl. 346-33.00A.

Erickson, Richard A.: *See—*
Iepson, Harry E.; and Erickson, Richard A., 4,130,200, Cl. 206-333.000.

Ericsson, Sven O. Log feeding and de-branching mechanism. 4,130,151, Cl. 144-309.0AC.

Erie Technological Products, Inc.: *See—*
Hertz, Jerome J., 4,130,854, Cl. 361-304.000.

Erlichman, Irving; and Plummer, William T., to Polaroid Corporation. Flexible shutter for photographic camera. 4,130,357, Cl. 354-241.000.

Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, to SKF Industrial Trading and Development Company B.V. Packing means for shaft bushings. 4,130,286, Cl. 277-12.000.

Ernst Leitz Wetzlar GmbH: *See—*
Henkelmann, Kurt; Speier, Rolf; and Schafer, Wilhelm, 4,130,353, Cl. 353-85.000.

Ersfeld, Dean A.: *See—*
Fanselow, Dan L.; and Ersfeld, Dean A., 4,130,760, Cl. 250-474.000.

ESCO Corporation: *See—*
Gettman, Herman W., 4,129,934, Cl. 29-427.000.

Eshnaur, Helen E.: *See—*
Eshnaur, W. Scott; and Eshnaur, Helen E., 4,130,092, Cl. 119-159.000.

Eshnaur, W. Scott; and Eshnaur, Helen E. Dust bag for animal insecticide. 4,130,092, Cl. 119-159.000.

Essig, Dieter: *See—*
Roos, Otto; and Essig, Dieter, 4,130,558, Cl. 260-239.100.

Ethicon, Inc.: *See—*
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,130,639, Cl. 424-78.000.

Evans, David F.; and Yindra, Leonard J., to American Hospital Supply Corporation. Vertically-adjustable two-post drafting table. 4,130,069, Cl. 108-136.000.

Evans, Mervyn; and Harris, John D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Social Services in Her Britannic Majesty's Government of the. Reels for medical traction applications. 4,130,250, Cl. 242-68.000.

Evans, Robert A.; and Momberg, James W., to Consolidated Foods Corporation. Hose coupling for upright vacuum cleaner. 4,129,920, Cl. 15-337.000.

Evans, Robert K.: *See—*
Chocholaty, Warren L.; Evans, Robert K.; and Perry, Francis J., 4,130,126, Cl. 137-3.000.

Evers, Ann P.; Edwards, Roderick I.; and Fieberg, Monika M., to National Institute for Metallurgy, The. Recovery and purification of iridium. 4,130,625, Cl. 423-22.000.

Evolution S.A.: *See—*
Hamel, Edmund, 4,129,979, Cl. 57-59.000.

Exxon Production Research Company: *See—*
Bombardieri, Caurino C., 4,130,163, Cl. 166-252.000.

Exxon Research & Engineering Co.: *See—*
Lepert, Andre, 4,130,701, Cl. 526-76.000.
Longo, John M.; and Steger, John J., 4,130,492, Cl. 252-18.000.
Lundberg, Robert D.; and Thame, Neville G., 4,130,517, Cl. 260-29.20N.
Roper, Robert; Newman, Neil F.; and Hous, Pierre, 4,130,519, Cl. 260-23.70H.
Saidla, Glen E. W., 4,130,614, Cl. 264-46.400.
Shaub, Harold; and Metro, Stephen J., 4,130,494, Cl. 252-32.500.
Vandling, John M., 4,130,840, Cl. 358-281.000.

Falk, Gerhard, to Robert Bosch GmbH. Tape drive mechanism. 4,130,257, Cl. 242-193.000.

Fanselow, Dan L.; and Ersfeld, Dean A., to Minnesota Mining and Manufacturing Company. Reusable radiation monitor. 4,130,760, Cl. 250-474.000.

Farooq, Saleem: *See—*
Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, 4,130,655, Cl. 424-304.000.

Farr, Lee E. Double window having improved weather sealed ventilation. 4,129,964, Cl. 49-67.000.

Farrell, Mary S. Garment applying device. 4,130,226, Cl. 223-111.000.

Fasano, Osvaldo, to Morenar S.A. Apparatus for automatically treating pieces of exposed photosensitive paper. 4,130,825, Cl. 354-322.000.

Fast, Clarence R.; and King, George E., to Standard Oil Company (Indiana). Method for selectively plugging water zones. 4,130,165, Cl. 166-279.000.

Fearnley, Charles: *See—*
Lee, Frank; Allan, James; and Fearnley, Charles, 4,130,498, Cl. 252-99.000.

Federal Paper Board Co., Inc.: *See—*
Manizza, Guelfo A., 4,130,236, Cl. 229-31.00R.

Federal Screw Works: *See—*
Ostrowski, Carl L., 4,130,730, Cl. 179-1.0SM.

Feit, Eugene D.; and Thompson, Larry F., to Bell Telephone Laboratories, Incorporated. Process using radiation curable epoxy containing resist and resultant product. 4,130,424, Cl. 96-35.100.

Ference, Joseph; and Megles, John E., Jr., to Corning Glass Works. Strong, lightweight photosensitive laminate. 4,130,680, Cl. 428-68.000.

Ferguson, Clarence E.: *See—*
Ferguson, James B.; Ferguson, Ernie B.; and Ferguson, Clarence E., 4,130,180, Cl. 182-187.000.

Ferguson, Ernie B.: *See—*
Ferguson, James B.; Ferguson, Ernie B.; and Ferguson, Clarence E., 4,130,180, Cl. 182-187.000.

Ferguson, James B.; Ferguson, Ernie B.; and Ferguson, Clarence E. Tree climbing platform. 4,130,180, Cl. 182-187.000.

Ferguson, Russel O. Gas saver. 4,130,099, Cl. 123-141.000.

Ferranti Limited: *See—*
Nutter, Geoffrey, 4,130,880, Cl. 364-900.000.

Ferro, Nicholas J., to Ferro Novelty Company, Inc. Earring. 4,129,998, Cl. 63-12.000.

Ferro Novelty Company, Inc.: *See—*
Ferro, Nicholas J., 4,129,998, Cl. 63-12.000.

Fichte, Rudolf: *See—*
Breuer, Friedrich; Duderstadt, Gunter; Dresler, Werner; Fichte, Rudolf; Kunert, Peter; and Nassauer, Gerd, 4,130,417, Cl. 75-60.000.

Fieberg, Monika M.: *See—*
Evers, Ann P.; Edwards, Roderick I.; and Fieberg, Monika M., 4,130,625, Cl. 423-22.000.

Fiedler, Timothy, to ACF Industries, Inc. Staged accelerator pump. 4,130,609, Cl. 261-23.00A.

Fiegehen, Allan G.; Houghton, Robert P.; Bradley, Cecil Earl; and Richenburg, Paul F., to General Automation, Inc. Numerical control servo system. 4,130,788, Cl. 318-574.000.

Fieldhouse, John W., to Firestone Tire & Rubber Company, The. Chemical modification of poly(bis-aryloxyphosphazene) with amines. 4,130,547, Cl. 260-823.000.

Fields, Ellis K.: *See—*
Cerefice, Steven A.; Fields, Ellis K.; Marchant, Kerford A., Jr.; and Paschke, Edward E., 4,130,719, Cl. 528-305.000.

Filippova, Anna G., deceased: *See—*
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.

Filtronics Ltd.: *See—*
Jacoby, Ian H.; and Bangha, Roland V., 4,130,368, Cl. 402-41.000.

Findley, Jack R. Combination trolling and casting reel. 4,130,251, Cl. 242-84.20C.

Finley, Lloyd D.; and Kusper, Leroy F., to Caterpillar Tractor Co. Vent control for cylinder mounted load check valves. 4,130,049, Cl. 91-445.000.

Fioretta, Piero; and Richiardi, Claudio, to Societa di Elettronica per l'Automazione — SEPA Societa per Azioni. Automatic machine with articulated mechanical arm. 4,130,873, Cl. 364-513.000.

Firestone Tire & Rubber Company, The: *See—*
Fieldhouse, John W., 4,130,547, Cl. 260-823.000.

Firnhaber, Miles. Nickel-chromium alloys. 4,130,420, Cl. 75-134.00F.

Fischer, Allen: *See—*
Weinhaus, Theodore; and Fischer, Allen, 4,129,950, Cl. 33-178.00R.

Fischer, Craig A.: *See—*
Moore, Gregory R.; and Fischer, Craig A., 4,130,458, Cl. 162-159.000.

Fischer, Eliezer Z.: *See—*
Chazan, Reuwen R, deceased; Chazan, Dan, heir; Chazan, David Y., heir; and Fischer, Eliezer Z., 4,130,640, Cl. 424-80.000.

Fitch, Lawrence R.; and Swenson, Jerry L., to Fitch, Lawrence R. Printed circuit board scrubber and dryer. 4,129,919, Cl. 15-302.000.

Flamm, Daniel L.: *See—*
United States of America, National Aeronautics and Space Administration; Flamm, Daniel L.; and Wydeven, Theodore J., Jr., 4,130,490, Cl. 250-531.000.

Flanagan, Paul, to Flynn Burner Corporation. Non-contaminating fuel burner. 4,130,388, Cl. 431-116.000.

Fleck, Franz, to ITT Industries, Inc. Pressure-regulating valve for vehicular braking systems. 4,130,321, Cl. 303-13.000.

Flowstar Industries, Inc.: *See—*
Illes, Charles P., Jr., 4,130,225, Cl. 222-411.000.

Flynn Burner Corporation: *See—*
Flanagan, Paul, 4,130,388, Cl. 431-116.000.

FMC Corporation: *See—*
Chase, Lee M.; and Muray, Julius J., 4,130,481, Cl. 210-6.000.
Lill, Melvin H.; and Wiederrich, James L., 4,130,362, Cl. 356-152.000.
Lutz, Charles W.; and Cohen, Leon E., 4,130,501, Cl. 252-186.000.
Plummer, Ernest L., 4,130,657, Cl. 424-305.000.
Velenovsky, Joseph J.; and Alvarez, Manuel, 4,130,629, Cl. 423-240.000.

Fodor, Lawrence M., to Phillips Petroleum Company. Phosphite in MgX_2 supported $TiX_3/AlCl_3$ catalyst system. 4,130,503, Cl. 252-429.00B.

Ford, Eric H., to Lumenition Limited. Ignition systems for internal combustion engines. 4,130,096, Cl. 123-117.00R.

Ford, Eric H. Ignition systems for internal combustion engines. 4,130,097, Cl. 123-117.00R.

Ford, Michael A., to Perkin-Elmer Limited. Apparatus for compensating ordinate phase lag in a plotting apparatus. 4,130,784, Cl. 318-102.000.

Ford Motor Company: *See—*
Gropp, Karl H., 4,130,094, Cl. 123-119.00A.

Foresight Industries: *See—*
Deike, Robert F., 4,130,168, Cl. 173-38.000.

Forth, Charles R.: *See—*
Olsen, James R.; and Forth, Charles R., 4,130,871, Cl. 364-411.000.

Fosslien, Egil, to Cortex Research Corporation. Particle counting. 4,130,754, Cl. 235-92.0PC.

Fotis, Peter: *See—*
Hoff, Glen R.; Melquist, John L.; and Fotis, Peter, 4,130,699, Cl. 526-67.000.

Fox, Anthony. Aircraft with retractable auxiliary power unit. 4,130,258, Cl. 244-58.000.

Fox, Lester A., to Colgate-Palmolive Company. Method for sterilizing with and recycling of ethylene oxide. 4,130,393, Cl. 422-31.000.

Fox, Philip R., to Midwest Bindery Enterprises, Inc. Display device. 4,130,197, Cl. 206-45.260.

Francis, Martin H.: *See—*
Bowman, Rodney V.; and Francis, Martin H., 4,130,899, Cl. 365-222.000.

Franklin, Benjamin S.: *See—*
Bachman, Charles W.; and Franklin, Benjamin S., 4,130,867, Cl. 364-200.000.

Franz, John E., to Monsanto Company. N-Organo-N-phosphonomethylglycine-N-oxides and phytotoxicant compositions containing same. 4,130,412, Cl. 71-86.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,130,062, Cl. 104-7.00R.
Theurer, Josef; and Praschl, Wilhelm, 4,130,063, Cl. 104-12.000.

Frasher, Wallace G.; Netto, Daniel J.; and Marcus, Carol S., to University of Southern California. Apparatus for microscopically viewing a specimen while detecting radiation particles therefrom. 4,130,757, Cl. 250-336.000.

Frassanito, John R.: *See—*
Norman, Richard O.; and Frassanito, John R., 4,130,224, Cl. 222-185.000.

Frazer, August H.; Harris, John F., Jr.; and Martin, Elmore L., to Du Pont de Nemours, E. I., and Company. Bis(2-methyl-2-cyanopropyl) aromatics. 4,130,579, Cl. 260-465.00H.

Frazer, Robert E., to United States of America, National Aeronautics and Space Administration. Coupling apparatus for ultrasonic medical diagnostic system. 4,130,112, Cl. 128-2.00V.

Frechet, Daniel: *See—*
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,130,658, Cl. 424-308.000.

Freehauf, Millard F. Indexed memory coordinator. 4,130,849, Cl. 360-137.000.

Friedlander, Charles B.; and McMullen, John C., to PPG Industries, Inc. Siloxane urethane acrylate radiation curable compounds for use in coating compositions. 4,130,708, Cl. 528-28.000.

Friesen, David. Harvester swath pickup. 4,129,978, Cl. 56-364.000.

Fritz Studer AG.: *See—*
Luthi, Hans, 4,130,205, Cl. 214-1.0BB.

Frolkina, Irina T.: *See—*
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.

Fry, James L., to University of Toledo. Method for increasing the hydrogen:carbon ratio of an organic compound. 4,130,574, Cl. 260-465.00F.

Fryer, Rodney I.: *See—*
Gilman, Norman; and Fryer, Rodney I., 4,130,716, Cl. 548-369.000.

Fuchs, Ernst E., to Mecafina S.A. Magnetic particle test system using movable test piece clamping means movable jointly or independently. 4,130,800, Cl. 324-216.000.

Fuhrer, Walter: *See—*
Ilvespaa, Atso; and Fuhrer, Walter, 4,130,652, Cl. 424-274.000.

Fuji Photo Film Co., Ltd.: *See—*
Kaneko, Shiro, 4,130,128, Cl. 137-269.000.
Sugiyama, Masatoshi; and Kato, Eiichi, 4,130,430, Cl. 96-84.00A.
Takeda, Keiji; and Tsuboi, Masayoshi, 4,130,426, Cl. 96-49.000.

Fuks, Abram. Traffic jam board game. 4,130,284, Cl. 273-248.000.

Fulrath, Marilyn M., executrix: *See—*
Nagesh, Voddarahalli K.; and Fulrath, Richard M., deceased, 4,130,671, Cl. 427-125.000.

Fulrath, Richard M., deceased: *See—*
Nagesh, Voddarahalli K.; and Fulrath, Richard M., deceased, 4,130,671, Cl. 427-125.000.

Gabriel, Richard J., to Matrix Toys, Inc. Construction set having clip fasteners. 4,129,975, Cl. 52-648.000.

Gagle, Duane W.; and Draper, Homer L., to Phillips Petroleum Company. High ductility asphalt. 4,130,516, Cl. 260-28.5AS.

Gagnon, Richard T., to Scitronix Corporation. Compressed speech system. 4,130,729, Cl. 179-1.05A.

Gale, John A., to American Guidance Service, Inc. Interlocking blocks. 4,129,960, Cl. 46-25.000.

Gallo, Luigi C.; and Sheikh, Junaid, to Ampex Corporation. Circuit for generating a digital, deleted data, blinking cross signal which is stored in a deleted track and selectively displayed for detection. 4,130,842, Cl. 360-35.000.

Gans, Eugene H.: *See—*
Dhabhar, Dadi J.; Heyd, Allen; and Gans, Eugene H., 4,130,638, Cl. 424-55.000.

Ganz Brothers, Inc.: *See—*
Duerr, Joseph W., 4,130,201, Cl. 206-432.000.

Gapper, Terence J., to Coal Industry (Patents) Limited. Mining machines. 4,130,319, Cl. 299-1.000.

Gaputis, Charles A.: *See—*
Dutkewych, Oleh B.; Gaputis, Charles A.; Gulla, Michael; and Levy, Leonard R., 4,130,454, Cl. 156-659.000.

Garland, Barbara R.: *See—*
Thomas, Charles H.; and Garland, Barbara R., 4,130,520, Cl. 260-29.20N.

Garner, Joseph L., to Dow Chemical Company, The. Electroconductive resins and intermediates and electroconductive coated paper. 4,130,688, Cl. 428-342.000.

Garnier, Regis; and Delpla, Claude, to Societe Generale de Fonderie. Mixing tap. 4,130,136, Cl. 137-625.410.

Garrett Corporation, The: *See—*
Brudnicki, Myron J., 4,130,051, Cl. 98-1.500.

Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Khlopkov, Leonid P.; Nesterovsky, Sergei G.; Starun, Andrei I.; Mironov, Viktor D.; Dibrov, Gennady D.; and Panasenko, Anatoly A. Method of preparing batch for manufacture of clay brick. 4,130,439, Cl. 106-67.000.

Gasparic, Vesna: *See—*
Rosengren, Ake; Bjellqvist, Bengt; and Gasparic, Vesna, 4,130,470, Cl. 204-180.00G.

Gatilao, Lamberto S., to Liftomatic Material Handling, Inc. Multiple head drum lift unit. 4,130,212, Cl. 214-653.000.

Geitz, Gunter: *See—*
Heyden, Gunter; and Geitz, Gunter, 4,130,039, Cl. 83-356.300.

Gelbshtein, Anatoly I.: *See—*
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.

Gelenkwellenbau GmbH: *See—*
Schultenkamper, Josef, 4,130,325, Cl. 308-163.000.

Geleski, Charles J.: *See—*
Cosco, Robert J.; Kokinos, Charles C., Jr.; and Geleski, Charles J., 4,130,774, Cl. 313-318.000.

General Automation, Inc.: *See—*
Fiegehen, Allan G.; Houghton, Robert P.; Bradley, Cecil Earl; and Richenburg, Paul F., 4,130,788, Cl. 318-574.000.

General Cable Corporation: *See—*
Bahder, George; Eager, George S., Jr.; and Silver, David A., 4,130,450, Cl. 156-48.000.

General Dynamics Corporation: *See—*
Block, Kenneth A.; and Lader, Leon J., 4,130,059, Cl. 102-34.400.

General Electric: *See—*
Kochanowski, John E., 4,130,548, Cl. 528-197.000.
Olander, Walter K., 4,130,544, Cl. 528-215.000.

General Electric Company: *See—*
Bennett, Moreland P.; and Bowers, William L., 4,130,750, Cl. 219-78.150.
Dunham, Harry J.; and Hurd, Gordon P., 4,130,301, Cl. 285-47.000.
Giles, Walter B., 4,130,373, Cl. 415-1.000.
Hardin, Louis W.; and Taylor, Lawrence D., 4,129,996, Cl. 62-262.000.
Hehmann, Horst W. W., 4,130,175, Cl. 181-290.000.
Kirkpatrick, Conilee G.; and Parks, Harold G., 4,130,891, Cl. 365-105.000.
LaForest, James J., 4,130,861, Cl. 363-39.000.
Mark, Victor; and Wilson, Phillip S., 4,130,530, Cl. 260-29.1SB.
Merrill, Duane F.; and Cooke, Richard C., Jr., 4,130,599, Cl. 260-825.000.

General Electric Company Limited, The: *See—*
Perez-Cavero, Leonardo, 4,130,851, Cl. 361-82.000.

General Motors Corporation: *See—*
Anderson, Walter W., 4,130,232, Cl. 228-57.000.
Bowler, Lauren L.; and Lahiff, John E., 4,130,095, Cl. 123-32.0EE.
Walter, John O., 4,130,623, Cl. 264-293.000.

General Staple Company, Inc.: *See—*
Zahn, Irwin, 4,129,941, Cl. 29-753.000.

George, Henry H., to Chemetron Corporation. Reinforced pipe cross fitting. 4,130,303, Cl. 285-137.00R.

Georgia-Pacific Corporation: *See—*
Bornstein, Leopold F., 4,130,515, Cl. 260-17.500.

Gettman, Herman W., to ESCO Corporation. Method of installing and removing locking device for earth working tool. 4,129,934, Cl. 29-427.000.

Geyer & Co.: *See—*
Schroer, Peter, 4,130,264, Cl. 249-180.000.

GfE Gesellschaft fur Elektrometallurgie mit beschrankter Haftung: *See—*
Breuer, Friedrich; Duderstadt, Gunter; Dresler, Werner; Fichte, Rudolf; Kunert, Peter; and Nassauer, Gerd, 4,130,417, Cl. 75-60.000.

Giandomenico, Anthony; Dame, James M.; and Behimer, Harold, to United States of America, National Aeronautics and Space Administration. High-torque open-end wrench. 4,130,032, Cl. 81-119.000.

Giles, Walter B., to General Electric Company. Erosion suppression for liquid-cooled gas turbines. 4,130,373, Cl. 415-1.000.

Gilliams, Yvan K.; De Winter, Walter F.; Van Paesschen, August J.; and Timmerman, Daniel M., to Agfa-Gevaert, N.V. Process for fixing toner images. 4,130,670, Cl. 427-16.000.

Gilman, Norman; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Pyrazolo benzodiazepines. 4,130,716, Cl. 548-369.000.

Giovagnoni, George. Remote alarm reset apparatus. 4,130,732, Cl. 179-5.00R.

Giroux, Eugene L.; Prakash, Nellikunja J.; and Schechter, Paul J., to Merrell Toraude et Compagnie. Method of treating hypertension. 4,130,653, Cl. 424-274.000.

Gist-Brocades N.V.: *See—*
Marx, Arthur F.; and Vos, Cornelis, 4,130,665, Cl. 424-331.000.

Givaudan Corporation: *See—*
Dubs, Paul; and Kuntzel, Heiner, 4,130,562, Cl. 260-302.00S.

Glass, Alastair M.; Lines, Malcolm E.; and Nassau, Kurt, to Bell Telephone Laboratories, Incorporated. Amorphous metal oxide material between electrodes of a cell. 4,130,694, Cl. 429-193.000.

Global Marine, Inc.: *See—*
Person, Abraham; and Ozudogru, Yilmaz H., 4,130,077, Cl. 114-230.000.

Globe-Union Inc.: *See—*
Levijoki, David H., 4,130,722, Cl. 174-68.500.

Goddard, Terrence P., to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc. Bis-triaminoguanidine decahydrodecaborate, process for preparation, and high energy propellant. 4,130,585, Cl. 260-564.00D.

Goldie, Harry, to United States of America, Navy. Frequency-agile fire control radar system. 4,130,821, Cl. 343-17.10R.

Goldner, Richard. Device adapted for self-determining, unpredictable variations in movement. 4,129,962, Cl. 46-120.000.

Gole, Jean: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, 4,130,703, Cl. 526-173.000.

Good, Millard F.: *See—*
Elias, Moenes L.; and Good, Millard F., 4,130,455, Cl. 156-666.000.

Goodrich, Albert S.; and Corcoran, Thomas M., to Picker Corporation. Ultrasonic sector scanning search unit. 4,130,022, Cl. 73-633.000.

Goodrich, Albert S.: *See—*
Mueller, Peter G.; and Goodrich, Albert S., 4,130,021, Cl. 73-633.000.

Goodyear Tire & Rubber Company, The: *See—*
Hampshire, William J., 4,130,154, Cl. 152-158.000.
Harris, James T., 4,130,144, Cl. 141-9.000.

Gordon, Stanley H. Metal ornamentation and method of welding. 4,130,751, Cl. 219-98.000.

Gore, Douglas A.: *See—*
Clay, Burton R.; and Gore, Douglas A., 4,130,338, Cl. 350-3.820.

Goto, Kazuo; Toyoda, Shinichi; and Sakai, Masahiko, to Hitachi Chemical Company, Ltd. Thermosetting resin composition. 4,130,546, Cl. 528-73.000.

Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft: *See—*
Wilop, Albert, 4,130,612, Cl. 261-91.000.

Gottlieb, Benjamin. Hearing aid reliner and apparatus for relining hearing aid ear molds. 4,130,741, Cl. 179-107.00E.

Gould Inc.: *See—*
Cronin, John C.; and Schuetz, Willy, 4,130,850, Cl. 361-54.000.
Dethlefsen, Rolf, 4,130,781, Cl. 315-331.000.
Dethlefsen, Rolf, 4,130,782, Cl. 315-335.000.
Iepson, Harry E.; and Erickson, Richard A., 4,130,200, Cl. 206-333.000.
Reighter, David H., 4,130,536, Cl. 260-37.0EP.

Graf, Godi, to Maschinenfabrik Gietz AG. Process and apparatus for the production of cardboard plates and the like. 4,130,050, Cl. 93-1.00D.

Graham, Charles M., to Richards Manufacturing Co., Inc. Retractor. 4,130,113, Cl. 128-20.000.

Graham, Danny. Laser dummy load. 4,130,363, Cl. 356-225.000.

Grassi, Guido; Baumann, Hans-Peter; and Pummer, Helmut, to Sandoz Ltd. Oxyalkylated alkyl polyamines as defoaming agents. 4,130,589, Cl. 260-584.00B.

Grauel, Stephen L. Combined mounting for through-the-wall viewer and intercom. 4,130,728, Cl. 179-1.00H.

Gravi-Mechanics Co.: *See—*
Dedolph, Richard R., 4,130,072, Cl. 111-2.000.

Gray, Leonard: *See—*
Perry, Francis V., Jr.; Barlik, Richard P.; Richardson, William P.; Hudson, Robert H.; and Gray, Leonard, 4,129,963, Cl. 46-155.000.

Greenberger, Harry: *See—*
Horwitt, Laurence G.; Mattis, Donald J.; and Greenberger, Harry, 4,130,815, Cl. 338-282.000.

Greene, Frederick C., to Shepherd Products U.S. Inc. Plastic grip ring. 4,129,921, Cl. 16-38.000.

Gregg, Richard, to Procter & Gamble Company, The. Method of making an improved tea volatiles concentrate. 4,130,669, Cl. 426-385.000.

Gregory, Eugene H.: *See—*
Katz, Joel; and Gregory, Eugene H., 4,130,811, Cl. 332-18.000.

Gresen Manufacturing Company: *See—*
Blume, Nicholas C., 4,129,987, Cl. 60-445.000.

Greuter, Hans; Martin, Pierre; Bellus, Daniel; Gsell, Laurenz; and Meyer, Willy, to Ciba-Geigy Corporation. Pesticidal 1-(phenyl)-cyclobutane-1-carboxylates. 4,130,656, Cl. 424-304.000.

Groner, Carl F., to Eastman Kodak Company. Electrophoretic migration imaging apparatus and method utilizing enlarged migration environment. 4,130,359, Cl. 355-3.00P.

Gropp, Karl H., to Ford Motor Company. Exhaust gas recirculation valve assembly. 4,130,094, Cl. 123-119.00A.

Grose, Zacharie: *See—*
Peffer, Robert M.; Rehn, Albert H.; and Grose, Zacharie, 4,130,852, Cl. 361-213.000.

Grover, John H. H., to National Research Development Corporation. Safe take-off indicators. 4,130,015, Cl. 73-178.00T.

Grunbaum, Benjamin W.: *See—*
United States of America, National Aeronautics and Space Administration; and Grunbaum, Benjamin W., 4,130,471, Cl. 204-180.00G.

Grundler, Bruno; Heinzer, Hans; and Muller, Werner, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for forming, filling and closing bags. 4,129,976, Cl. 53-552.000.

Gsell, Laurenz: *See—*
Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, 4,130,655, Cl. 424-304.000.
Greuter, Hans; Martin, Pierre; Bellus, Daniel; Gsell, Laurenz; and Meyer, Willy, 4,130,656, Cl. 424-304.000.

GTE Sylvania Incorporated: *See—*
Blaisdell, Ronald G.; Hall, Harold H., Jr.; and Hough, Harold L., 4,130,081, Cl. 116-5.000.
Bouchard, Andre C.; Hall, Harold H., Jr.; Patton, Robert J.; and Sentementes, Thomas J., 4,130,082, Cl. 116-5.000.
Bouchard, Andre C.; and Hall, Harold H., Jr., 4,130,083, Cl. 116-114.500.
Brower, Boyd G., 4,130,857, Cl. 362-10.000.
Cosco, Robert J.; Kokinos, Charles C., Jr.; and Geleski, Charles J., 4,130,774, Cl. 313-318.000.
Dziedzic, Chester J.; and Cleveland, Joseph J., 4,130,160, Cl. 165-166.000.
Kam, George H.; and Logan, Robert P., 4,130,829, Cl. 358-10.000.

Guerard, Daniel: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, 4,130,703, Cl. 526-173.000.

Guerrini, Giampaolo; and Trompetto, Mario, to Ing. C. Olivetti & C., S.p.A. Cartridge for an endless inked ribbon for printing office machines. 4,130,367, Cl. 400-195.000.

Guildford, Leslie H., to U.S. Philips Corporation. Electrical waveform analysis. 4,130,835, Cl. 358-160.000.

Guilini Chemie G.m.b.H.: *See—*
Schepers, Bernhard; Hellinghausen, Heinz; and Kramer, Alois, 4,130,402, Cl. 51-309.00A.

Gulf Oil Corporation: *See—*
Hill, Donald R. J., 4,130,618, Cl. 264-123.000.

Gulla, Michael: *See—*
Dutkewych, Oleh B.; Gaputis, Charles A.; Gulla, Michael; and Levy, Leonard R., 4,130,454, Cl. 156-659.000.

Gunckel, Thomas L., II; Rovell, Alex; and Nielsen, Robert L., to Rockwell International Corporation. Radiation hard memory cell and array thereof. 4,130,892, Cl. 365-154.000.

Gunther, Ronald G., to Yardney Electric Corporation. Conductive diluent for pressed nickel electrodes. 4,130,696, Cl. 429-223.000.

Gutzschebauch, Claus: *See—*
Ploger, Walter; and Gutzschebauch, Claus, 4,130,630, Cl. 423-265.000.

Gutzwiller, Robert L. Racquet stringing machine. 4,130,278, Cl. 273-73.00A.

H. K. Porter Company, Inc.: *See—*
Bohrer, George J., 4,130,537, Cl. 260-38.000.

Haapala, Jalo. Structural space element. 4,129,969, Cl. 52-79.900.

Habermeier, Jurgen, to Ciba-Geigy Corporation. Dicarboxylic acid derivatives containing heterocyclic radicals. 4,130,560, Cl. 544-302.000.

Hackett, Stephen J.: *See—*
Collier, Owen N.; and Hackett, Stephen J., 4,130,506, Cl. 252-438.000.

Haessler, Herbert A.; Elshtain, Errol L.; and Holland, Taffy, to Searle Medidata, Inc. System and technique for automated medical history taking. 4,130,881, Cl. 364-900.000.

Hagenbucher, Hariolf. Method of making tubular coils with cooling and insulating channels. 4,129,938, Cl. 29-605.000.

Haimson, Jacob, to Haimson Research Corporation. Method and apparatus incorporating no moving parts, for producing and selectively directing x-rays to different points on an object. 4,130,759, Cl. 250-445.00T.

Haimson Research Corporation: *See—*
Haimson, Jacob, 4,130,759, Cl. 250-445.00T.

Haines, Allan D., to National Machinery Company, The. High speed ball header. 4,130,005, Cl. 72-360.000.

Haldor Topsoe A/S: *See—*
Jorn, Ernst, 4,130,575, Cl. 260-449.00M.

Hall, Harold H., Jr.: *See—*
Blaisdell, Ronald G.; Hall, Harold H., Jr.; and Hough, Harold L., 4,130,081, Cl. 116-5.000.
Bouchard, Andre C.; Hall, Harold H., Jr.; Patton, Robert J.; and Sentementes, Thomas J., 4,130,082, Cl. 116-5.000.
Bouchard, Andre C.; and Hall, Harold H., Jr., 4,130,083, Cl. 116-114.500.

Hall, Ira L., to Du Pont de Nemours, E. I., and Company. Process for preparing a ball-point pen ink. 4,130,435, Cl. 106-22.000.

Hall, John B.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.

Hall, Ralph A.; and Radley, Peter E., to International Standard Electric Corporation. Feedforward amplifiers. 4,130,807, Cl. 330-124.00R.

Hallerback, Stig L., to Aktiebolaget SKF. Dismantling tool. 4,130,399, Cl. 29-225.000.

Haloff, Gary J., to United States of America, Air Force. Method and system of controlling a jet engine for avoiding engine surge. 4,130,872, Cl. 364-431.000.

Hamamura, Kimio: *See—*
Kijima, Shizumasa; Shionoya, Hiroshi; Hamamura, Kimio; Arai, Haruyoshi; and Koyanagi, Nozomu, 4,130,648, Cl. 424-251.000.
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,130,659, Cl. 424-312.000.

Hamashima, Yoshio; Tsuji, Teruji; Yoshioka, Mitsuru; Narisada, Masayuki; Komeno, Taichiro; Tanida, Hiroshi; and Nagata, Wataru, to Shionogi & Co., Ltd. Method for the hydrolysis of azetidinothiazoline compounds. 4,130,557, Cl. 260-239.00A.

Hamel, Edmund, to Evolution S.A. Apparatus for twisting a yarn. 4,129,979, Cl. 57-59.000.

Hamilton, Alan D.; Peterson, Gregory P.; and McGuire, Walter R., to Standard Oil Company (Indiana). Process for the manufacture of filament wound pipe using deformable material at the wind stops. 4,130,451, Cl. 156-86.000.

Hamilton, Robert S., to Carborundum Company, The. BN Bonded BN fiber article from boric oxide fiber. 4,130,631, Cl. 423-290.000.

Hampshire, William J., to Goodyear Tire & Rubber Company, The. Curved reinforced support member. 4,130,154, Cl. 152-158.000.

Hampson, James W.: *See—*
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 4,130,572, Cl. 260-410.700.

Handte, Reinhard; Horlein, Gerhard; Kocher, Helmut; and Langeludeke, Peter, to Hoechst Aktiengesellschaft. Heterocyclic phenyl ethers and herbicides containing same. 4,130,413, Cl. 71-90.000.

Hans Sickinger Co.: *See—*
Pfaffle, Ernst, 4,129,913, Cl. 11-1.00A.

Hardin, Louis W.; and Taylor, Lawrence D., to General Electric Company. Vent system for a self-contained air conditioner. 4,129,996, Cl. 62-262.000.

Haren, Doyle V., to Dayco Corporation. Flexible hose construction and method of making same. 4,130,139, Cl. 138-125.000.

Harmon, Raymond E.: *See—*
Poe, L. Richard; and Harmon, Raymond E., 4,130,307, Cl. 292-179.000.

Harmon, Stanley D. Elbow prosthesis. 4,129,902, Cl. 3-1.910.

Harris, Guy H.: *See—*
Podobnik, Donald M.; and Harris, Guy H., 4,130,477, Cl. 209-166.000.

Harris, James T., to Goodyear Tire & Rubber Company, The. Apparatus and method for dispensing fluid within a tire. 4,130,144, Cl. 141-9.000.

Harris, John D.: *See—*
Evans, Mervyn; and Harris, John D., 4,130,250, Cl. 242-68.000.

Harris, John F., Jr.: *See—*
Frazer, August H.; Harris, John F., Jr.; and Martin, Elmore L., 4,130,579, Cl. 260-465.00H.

Hartman, Adrian R.: *See—*
D'Altroy, Frederick A.; Hartman, Adrian R.; Jacobs, Richard M.; Pritchett, Robert L.; and Shackle, Peter W., 4,130,827, Cl. 357-38.000.

Hartmann, Willy: *See*—
Scholz, Karl-Heinz; Hartmann, Willy; and Heine, Hans-Georg, 4,130,563, Cl. 260-307.00C.
Hartvig, Tor, to Raufoss Ammunisjonsfabrikker A/S. Austenitic wear-resistant steel. 4,130,418, Cl. 75-126.00B.
Hartwell Corporation: *See*—
Poe, L. Richard, 4,130,260, Cl. 244-129.500.
Poe, L. Richard; and Harmon, Raymond E., 4,130,307, Cl. 292-179.000.
Hasbro Development Corp.: *See*—
Perry, Francis V., Jr.; Barlik, Richard P.; Richardson, William P.; Hudson, Robert H.; and Gray, Leonard, 4,129,963, Cl. 46-155.000.
Hashimoto, Nobuyuki: *See*—
Sakakibara, Naoji; and Hashimoto, Nobuyuki, 4,130,265, Cl. 251-11.000.
Hasson, Victor H.; and von Bergmann, Hubertus M., to South African Inventions Development Corporation. Travelling wave laser. 4,130,809, Cl. 331-94.5PE.
Hatter, Edward E.; and Taylor, Richard H. Circle drawing and measuring device. 4,129,948, Cl. 33-27.00C.
Hattori, Tadashi; and Yamaguchi, Hiroaki, to Nippon Soken, Inc. Gas component sensing apparatus. 4,130,797, Cl. 324-65.00P.
Haubold, Heinz G.: *See*—
Kussel, Eckhard; Haubold, Heinz G.; Joswig, Franz; and Klatt, Karl H., 4,130,772, Cl. 313-32.000.
Haug, Theobald; Kiefer, Jurg; and Renner, Alfred, to Ciba-Geigy Corporation. Process for the manufacture of maleimides. 4,130,564, Cl. 260-326.260.
Hausam, Leonard P. Coffee dispenser. 4,130,149, Cl. 141-358.000.
Hauser, Karl V.; and Mencenberg, Fred, to Edw. C. Levy Co. Process for reclaiming foundry sand wastes. 4,130,436, Cl. 106-38.900.
Hautemont, Jean-Claude H., to Societe Anonyme dite: Etude et Realisation de Chaines Automatiques Erca. Device for preforming and holding a wrapper in a forming mould. 4,130,386, Cl. 425-383.000.
Hawn, Richard Dean, Jr.: *See*—
Burge, Edward V., 4,130,000, Cl. 64-1.00V.
Hayakawa, Yoshito, to Yamada Iryo Shomei Kabushiki Kaisha. Lamp-moving device. 4,130,858, Cl. 362-150.000.
Hayasaka, Toshimi; and Nakajima, Toshikazu, to Olympus Optical Co., Ltd. Sliding means for precision machinery. 4,130,024, Cl. 74-29.000.
Hayashi, Hideki, to Nippon Rubber Co., Ltd. Footwear tester. 4,130,007, Cl. 73-7.000.
Hayes, John C., to UOP Inc. Nonacidic multimetallic catalytic composite. 4,130,507, Cl. 252-439.000.
Hazelton, Dean W., to Bethlehem Steel Corporation. Data communication system having bidirectional station interfaces. 4,130,883, Cl. 364-900.000.
Head, Nephi L.; Hempstead, Robert D.; Kennedy, Thomas N.; and Lieu, Fred Y., to International Business Machines Corporation. Corrosion resistant thin film head assembly and method for making. 4,130,847, Cl. 360-122.000.
Heagy, Richard T.: *See*—
Russ, James J.; Russ, James S.; and Heagy, Richard T., 4,130,627, Cl. 423-127.000.
Healy, Mark, to Senninger Irrigation, Inc. Spray nozzle. 4,130,247, Cl. 239-523.000.
Heart, Frank E.; Ornstein, Severo M.; Barker, William B.; and Crowther, William R., to Bolt Beranek and Newman Inc. Multiprocessor computer apparatus employing distributed communications paths and a passive task register. 4,130,865, Cl. 364-200.000.
Hebard, Harry D., to Don R. Hinderliter, Inc. Well head seal assembly. 4,130,304, Cl. 285-143.000.
Hedaya, Eddie; and Spyros, Theodoropulos, to Union Carbide Corporation. Method for preparing isocyanates from halosilyl carbamates. 4,130,576, Cl. 260-453.00P.
Hehmann, Horst W. W., to General Electric Company. Fluid-impervious acoustic suppression panel. 4,130,175, Cl. 181-290.000.
Heine, Hans-Georg: *See*—
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Heinrich, Allan E., to Dynex/Rivett Inc. Method of and means for preventing thermal shock to a hydraulic motor in an open-loop hydraulic system. 4,129,986, Cl. 60-327.000.
Heinzer, Hans: *See*—
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Heisey, Larry E., to Hobart Brothers Company. Ferroresonant transformer power supply. 4,130,790, Cl. 323-60.000.
Held, Franklin W., to Ektelon. Apparatus and method of making hollow articles. 4,130,619, Cl. 264-162.000.
Hellinghausen, Heinz: *See*—
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Hemmen, Marcel; and Heron, Jacky, to Regie Nationale des Usines Renault. Headrest with side pads. 4,130,318, Cl. 297-410.000.
Hempstead, Robert D.: *See*—
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Hendrix, Ronald W.; Klink, Jerome P.; and Dunn, John W., to Owens-Corning Fiberglas Corporation. Method and apparatus for packaging multistrand roving. 4,130,248, Cl. 242-18.00G.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Conrad, Jens; Bruns, Klaus; and Meins, Peter, 4,130,509, Cl. 252-522.000.
Ploger, Walter; and Gutzschebauch, Claus, 4,130,630, Cl. 423-265.000.
Henkelmann, Kurt; Speier, Rolf; and Schafer, Wilhelm, to Ernst Leitz Wetzlar GmbH. Projector with controls for the slide changer. 4,130,353, Cl. 353-85.000.
Henkels, Walter H., to International Business Machines Corporation. Josephson memory cells having improved NDRO sensing. 4,130,893, Cl. 365-162.000.
Henning, Wolfgang H. Fastening clip. 4,129,926, Cl. 24-22.000.
Henricksen, Clifford A., to Altec Corporation. Method and apparatus for testing and evaluating loudspeaker performance. 4,130,023, Cl. 73-647.000.
Herb, Samuel F.: *See*—
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Hergeth KG Maschinenfabrik und Apparatebau: *See*—
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Herrin, Cline E. Linearly translatable table top. 4,130,070, Cl. 108-143.000.
Hershey, Harold J.: *See*—
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Hertz, Jerome J., to Erie Technological Products, Inc. Borate treated nickel pigment for metallizing ceramics. 4,130,854, Cl. 361-304.000.
Hetzer, Fritz, to Purolator Filter G.m.b.H. Differential pressure threshold detector. 4,130,745, Cl. 200-82.00E.
Heuer, Dale A.; McCallister, Charles W.; and Schloss, Phillip C., to International Business Machines Corporation. Independently controllable multiple address registers for a data processor. 4,130,868, Cl. 364-200.000.
Hewertson, Warren; Holland, David; and Milner, David J., to Imperial Chemical Industries Limited. 2,5-Dimethyl-2,4-hexadiene production. 4,130,598, Cl. 260-680.00R.
Hewitt, Raymond, to Becton, Dickinson and Company. Apparatus for manufacturing spot test indicators. 4,130,085, Cl. 118-315.000.
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Heyden, Gunter; and Geitz, Gunter, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co., KG. Cutting device. 4,130,039, Cl. 83-356.300.
Hibino, Toshihiko, to Sumitomo Chemical Company, Limited. Process for producing 5-carboxy-2-acetylthiophene. 4,130,566, Cl. 260-332.20C.
Higgins, James R. Collapsible artificial Christmas tree. 4,130,678, Cl. 428-9.000.
Hildinger, Eugen, to Siemens Aktiengesellschaft. Text processing arrangement. 4,130,884, Cl. 364-900.000.
Hill, Donald R. J., to Gulf Oil Corporation. Ethylene polymer-petroleum wax compositions. 4,130,618, Cl. 264-123.000.
Hill, William F.; and Clark, Allan E., to Lucas Electrical Company Limited, The. Tire pressure warning devices. 4,130,817, Cl. 340-58.000.
Hills, Richard E.; Neely, Frank R.; Neely, Derek K.; and Malinowski, John T., to Pittsburgh-Des Moines Steel Company. Seal arrangement for floating roof storage tanks. 4,130,217, Cl. 220-226.000.
Hinterreiter, Ignaz. Ski pole handle of synthetic resin. 4,130,293, Cl. 280-11.37H.
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Hitachi Chemical Company, Ltd.: *See*—
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Hitachi, Ltd.: *See*—
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Hobbs, Charles F.; and McMackins, Dudley E., to Monsanto Company. Production of unsaturated amines. 4,130,590, Cl. 260-585.00D.
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Michel, Wolfgang; and Kalberger, Heinz, 4,130,683, Cl. 428-194.000.
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Hoegger, Cornel, to C. Hoegger & Cie. AG. Continual sausage stuffing apparatus. 4,129,923, Cl. 17-33.000.

Hoelen, Hermanus Josephus Eduardus J. M., to Stork Brabant B.V. Coating apparatus. 4,130,084, Cl. 118-59.000.
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Hoff, Dale R.: *See—*
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Hoff, Glen R.; Melquist, John L.; and Fotis, Peter, to Standard Oil Company (Indiana). Vapor phase polymerization with temporarily inactive titanium catalyst. 4,130,699, Cl. 526-67.000.
Hoffmann-La Roche Inc.: *See—*
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,130,713, Cl. 548-303.000.
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,130,568, Cl. 260-343.210.
Gilman, Norman; and Fryer, Rodney I., 4,130,716, Cl. 548-369.000.
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Hollister, John H., to Kendall Company, The. Pipe coating method and apparatus. 4,130,453, Cl. 156-187.000.
Holly, Frederick W.; Paleveda, William J.; Strachan, Robert G.; and Veber, Daniel F., to Merck & Co., Inc. Process for preparing somatostatin analog. 4,130,554, Cl. 260-112.50R.
Holman, Ronald H. C., to Barymin Explorations Limited. Probe for use in geological surveys. 4,130,170, Cl. 175-245.000.
Holt, Frederick R., to Apple Computer, Inc. DC Power supply. 4,130,862, Cl. 363-49.000.
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Cushing, David E., 4,130,879, Cl. 364-748.000.
Hoogeveen, Leonardus P. J.: *See—*
van Heusden, Sybrandus; and Hoogeveen, Leonardus P. J., 4,130,758, Cl. 250-361.00C.
Hooker Chemicals & Plastics Corp.: *See—*
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Hoople, Gary R., to United States of America, Navy. Miniature, flush mounted, microwave dual band cavity backed slot antenna. 4,130,823, Cl. 343-768.000.
Hoover, Raul M., to Amax Inc. Flotation separation of iron oxide from undigested matte particles obtained from autoclave leach residues. 4,130,626, Cl. 423-26.000.
Hope, Henry F.; and Hope, Stephen F. Strip straightening apparatus. 4,130,385, Cl. 425-136.000.
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Hope, Henry F.; and Hope, Stephen F., 4,130,385, Cl. 425-136.000.
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Horn, Hans, to TMC Corporation. Release ski binding. 4,130,297, Cl. 280-618.000.
Hornblad, Richard P., to Display Corporation International. Cigarette merchandiser. 4,130,326, Cl. 312-292.000.
Horne, Merton A.; and Brillhart, Bruce A., to Sperry Rand Corporation. MNOS FET memory retention characterization test circuit with enhanced sensitivity and power conservation. 4,130,897, Cl. 365-205.000.
Horwitt, Laurence G.; Mattis, Donald J.; and Greenberger, Harry, to Sun Chemical Corporation. Formed heating ribbon and coil. 4,130,815, Cl. 338-282.000.
Hosbein, Hugh W., to Mossberg Hubbard, a division of Wanskuck Company. Wire carrying spool. 4,130,256, Cl. 242-118.400.
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Hough, Harold L.: *See—*
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Hudson, Robert H.: *See—*
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Huffnagle, Clifton W.: *See—*
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Huggler, Arnold H. Hinge prosthetic joint with ball head. 4,129,903, Cl. 3-1.913.
Hughes Aircraft Company: *See—*
Katz, Joel; and Gregory, Eugene H., 4,130,811, Cl. 332-18.000.
Hughes, Gary C.: *See—*
Cameron, Daniel F.; Hughes, Gary C.; and Janssen, Harry R., 4,130,475, Cl. 208-54.000.
Hulteen, James M. Dishwasher indicating device. 4,129,954, Cl. 40-607.000.
Hummer, Roland; Thury, Wolfgang; Westerholt, Wilfried; Hollerling, Gundolf; and Strigl, Reinhard, to Linde AG. Process for the purification, modification and heating of a cast-iron melt. 4,130,419, Cl. 75-130.00R.
Humphrey Instruments, Inc.: *See—*
Humphrey, William E., 4,130,361, Cl. 356-125.000.
Humphrey, William E., to Humphrey Instruments, Inc. Lens meter without relatively moving optical parts. 4,130,361, Cl. 356-125.000.
Hunter, George S.; Hunter, Susanne P.; and Walker, Brian, to Process Scientific Innovations Ltd. Filters for liquids or gases. 4,130,487, Cl. 210-85.000.
Hunter, Susanne P.: *See—*
Hunter, George S.; Hunter, Susanne P.; and Walker, Brian, 4,130,487, Cl. 210-85.000.
Huntsberger, James R., to Du Pont de Nemours, E. I., and Company. Process for applying to glass an organic coating having controlled bond strength. 4,130,677, Cl. 427-379.000.
Hurd, Gordon P.: *See—*
Dunham, Harry J.; and Hurd, Gordon P., 4,130,301, Cl. 285-47.000.
Hutton, Ronald E.; and Burley, Joseph W., to Akzo N.V. Process for making organotin dihalides and trihalides. 4,130,573, Cl. 260-429.700.
Hyakumura, Kazushi, to Olympus Optical Co., Ltd. Retrofocus type wide angle lens system. 4,130,349, Cl. 350-216.000.
Iacoviello, Alan, to Olin Corporation. Hammer block. 4,130,231, Cl. 227-10.000.
Ibragimov, Isak M.: *See—*
Nudelman, Boris I.; Sventsitsky, Alexandr S.; Bikbau, Marsel Y.; Prikhozhan, Ada M.; and Ibragimov, Isak M., 4,130,441, Cl. 106-89.000.
Ichiyanagi, Takashi; Akiyama, Takashige; and Otoda, Ichizo, to Matsushita Electric Industrial Co., Ltd. Coating apparatus and method. 4,130,676, Cl. 427-358.000.
ICI Americas Inc.: *See—*
Rutledge, Thomas F., 4,130,504, Cl. 252-430.000.
Ida, Nobel, to Duraglass Research & Development Corp. Strengthening of glass. 4,130,407, Cl. 65-30.00E.
Iepson, Harry E.; and Erickson, Richard A., to Gould Inc. Display package for batteries or the like. 4,130,200, Cl. 206-333.000.
Igarashi, Toshiji: *See—*
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,130,659, Cl. 424-312.000.
Igloo Corporation: *See—*
Decker, Joseph A., Jr.; Amin, Bipinchandra; and Magruder, William R., 4,130,615, Cl. 264-46.500.
ILC Data Device Corporation: *See—*
Lanton, Seymour, 4,130,875, Cl. 364-603.000.
Iljunin, Vladimir G.; Murogov, Viktor M.; Troyanov, Mikhail F.; Rineisky, Anatoly A.; Ustinov, Gennady G.; and Shmelev, Anatoly N. Fuel assembly for fast reactor. 4,130,460, Cl. 176-68.000.
Illes, Charles P., Jr., to Flowstar Industries, Inc. Apparatus for facilitating the repair of a volumetric feeder. 4,130,225, Cl. 222-411.000.
Ilvespaa, Aino; and Fuhrer, Walter, to Ciba-Geigy Corporation. 2-(Iminoethylidene)-pyrrolidines and tautomeric 2-(aminoethenyl)-1-pyrrolines. 4,130,652, Cl. 424-274.000.
Imperial Chemical Industries Limited: *See—*
Ballard, Denis G. H.; Cundy, Colin S.; and Rideal, Graham R., 4,130,687, Cl. 428-310.000.
Clifford, Michael L., 4,130,616, Cl. 264-514.000.
Hewertson, Warren; Holland, David; and Milner, David J., 4,130,598, Cl. 260-680.00R.
Shephard, Margaret C.; and Worthington, Paul A., 4,130,409, Cl. 71-76.000.
Sparrow, David J.; and Van Autgaerden, Willy, 4,130,698, Cl. 521-130.000.
Inada, Masami; and Kitamura, Kazuhiko, to Aisin Seiki Kabushiki Kaisha. Pneumatic control system and pressure responsive valve assembly therefor. 4,130,267, Cl. 251-61.200.
Inadachi, Masaaki, to Hitachi, Ltd. Peripheral circuit in a memory system. 4,130,896, Cl. 365-203.000.
Inai, Yuithi: *See—*
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,130,659, Cl. 424-312.000.

Indri, John L. Process of constructing a ceramic catalyst support. 4,130,452, Cl. 156-89.000.

Industrial System Engineers, Inc.: *See—*
Smith, James M.; and Howe, Wilson S., 4,130,171, Cl. 177-1.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Conta, Renato; Montanari, Lucio; and Brescia, Riccardo, 4,130,752, Cl. 219-216.000.
Guerrini, Giampaolo; and Trompetto, Mario, 4,130,367, Cl. 400-195.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,130,448, Cl. 148-31.570.
Inoue, Kiyoshi, 4,130,493, Cl. 252-28.000.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. High-permeability magnetic alloy. 4,130,448, Cl. 148-31.570.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Machining fluid. 4,130,493, Cl. 252-28.000.

Inoue, Kyoichi: *See—*
Ban, Itsuki; Inoue, Kyoichi; and Kogure, Takatoshi, 4,130,780, Cl. 315-241.00P.

Institut de Recherches de la Siderurgie Francaise (Irsid): *See—*
Chastant, Marc; and Riboud, Paul-Victor, 4,130,423, Cl. 75-257.000.

Institut Francais du Petrole: *See—*
Cholet, Jacques, 4,130,078, Cl. 114-244.000.

International Business Machines Corporation: *See—*
Arndt, Richard L.; Meyerhofer, Wilfred L., Jr.; and Steinbauer, David M., 4,130,756, Cl. 235-474.000.
Bula, John; and Patrawala, Ashok C., 4,130,768, Cl. 307-270.000.
Chocholaty, Warren L.; Evans, Robert K.; and Perry, Francis J., 4,130,126, Cl. 137-3.000.
Head, Nephi L.; Hempstead, Robert D.; Kennedy, Thomas N.; and Lieu, Fred Y., 4,130,847, Cl. 360-122.000.
Henkels, Walter H., 4,130,893, Cl. 365-162.000.
Heuer, Dale A.; McCallister, Charles W.; and Schloss, Phillip C., 4,130,868, Cl. 364-200.000.
Knutson, Gerald R.; and Shidler, Karl A., 4,129,937, Cl. 29-603.000.
Merrill, Richard B.; and Yee, Yen S., 4,130,894, Cl. 365-183.000.
Millham, Ernest H.; Scaccia, Ralph J.; and Villante, Francis J., 4,130,240, Cl. 235-303.100.
Patel, Mukesh P.; and Yin, Huo-Bing, 4,130,766, Cl. 307-221.00D.
Patten, Michael A., 4,130,739, Cl. 179-100.1VC.

International Flavors & Fragrances Inc.: *See—*
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,130,508, Cl. 252-522.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.

International Mobile Machines Incorporated: *See—*
Bolgiano, Duane R.; Benjamin, Joel M., Jr.; and Meyer, Victor, Jr., 4,130,731, Cl. 179-2.0EB.

International Paper Company: *See—*
Costa, Eugene, Jr., 4,130,689, Cl. 428-398.000.

International Standard Electric Corporation: *See—*
Andre, Wolfram; and Kornaker, Walter, 4,130,837, Cl. 358-248.000.
Crossland, William A.; and Morrissy, Joseph H., 4,130,408, Cl. 65-43.000.
Hall, Ralph A.; and Radley, Peter E., 4,130,807, Cl. 330-124.00R.
Kornaker, Walter, 4,130,836, Cl. 358-248.000.

International Telephone & Telegraph Corp.: *See—*
Ashford, Donald A., 4,130,733, Cl. 179-15.0FD.

Intraco, Inc.: *See—*
Jones, Robert D., 4,130,223, Cl. 222-55.000.

Inukai, Mitsuo: *See—*
Mori, Mamoru; and Inukai, Mitsuo, 4,130,252, Cl. 242-107.100.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Toshihiro; and Saika, Tadaaki, 4,130,390, Cl. 432-14.000.

Islef & Hagen A/S: *See—*
Tjornemark, Erik, 4,130,183, Cl. 187-9.00R.

Isono, Katsuo; and Sanada, Seiji, to Sony Corporation. Color television control circuit for use with a VIR signal. 4,130,831, Cl. 358-27.000.

Isshiki, Tomiya; Tomita, Tetsuo; Abe, Mitsuo; and Takeda, Norio, to Mitsubishi Gas Chemical Company, Inc. Process for producing imine compounds. 4,130,586, Cl. 260-566.00R.

Itoh, Iko; Takahashi, Tsukasa; Takamuku, Shinkichi; Aramaki, Azuma; and Serada, Manabu, to Sumitomo Chemical Company, Limited. Apparatus for removing unreacted monomer from slurry. 4,130,456, Cl. 159-165.000.

ITT Industries, Inc.: *See—*
Adam, Fritz G., 4,130,890, Cl. 365-184.000.
Budecker, Ludwig; and David, Anton, 4,130,127, Cl. 137-101.000.
Fleck, Franz, 4,130,321, Cl. 303-13.000.

Iwashita, Tomonori: *See—*
Ohtaki, Shohei; Nakamoto, Soichi; Iwashita, Tomonori; Watanabe, Yoshiaki; and Kozuki, Susumu, 4,130,355, Cl. 354-33.000.

J. M. Ney Company, The: *See—*
Kulig, Frank M.; and Nealon, Frank H., 4,130,158, Cl. 164-289.000.

Jacobs, Anthony S.: *See—*
Cogswell, John A.; Klaszky, Fred E.; and Jacobs, Anthony S., 4,130,207, Cl. 214-6.00D.

Jacobs, Barry: *See—*
Reale, Michael J.; and Jacobs, Barry, 4,130,513, Cl. 521-107.000.

Jacobs, Richard M.: *See—*
D'Altroy, Frederick A.; Hartman, Adrian R.; Jacobs, Richard M.; Pritchett, Robert L.; and Shackle, Peter W., 4,130,827, Cl. 357-38.000.

Jacobson, John E. Combination smoker-cooker for food. 4,130,052, Cl. 99-339.000.

Jacoby, Ian H.; and Bangha, Roland V., to Filtronics Ltd. Plastic looseleaf binder ring assembly. 4,130,368, Cl. 402-41.000.

Jacques, James O., to Xerox Corporation. Apparatus for generating linear and continuous positional error and velocity signals for higher order servo systems. 4,130,786, Cl. 318-561.000.

Jahn, Gerhard. Automatic loading tray. 4,129,914, Cl. 11-2.000.

Jamiolkowski, Dennis D.: *See—*
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,130,639, Cl. 424-78.000.

Janssen, Harry R.: *See—*
Cameron, Daniel F.; Hughes, Gary C.; and Janssen, Harry R., 4,130,475, Cl. 208-54.000.

Japan Exlan Company Limited: *See—*
Arai, Kojiro; and Sugai, Noriaki, 4,130,465, Cl. 204-27.000.
Kobashi, Toshiyuki; Shiota, Hirotaka; and Umetani, Haruki, 4,130,525, Cl. 260-29.6AN.

Jarsen, Manfred H., to MCA Disco-Vision, Inc. Method for making video discs and video disc molds. 4,130,620, Cl. 264-225.000.

Jaunin, Roland, to Hoffmann-La Roche Inc. Process and intermediates for isoindole derivatives. 4,130,717, Cl. 560-35.000.

Jeavons, Philip S., to Wilmot-Breeden Limited. Motor vehicle door latches. 4,130,308, Cl. 292-216.000.

Jeffboat, Incorporated: *See—*
Carrigan, Eugene F., 4,129,931, Cl. 29-252.000.

Jeffrey, Joseph O., to Borg-Warner Corporation. Power transmission drive. 4,130,026, Cl. 74-245.00S.

Jelenevsky, Alex M.: *See—*
Petree, Harris E.; Myatt, Hal L.; and Jelenevsky, Alex M., 4,130,582, Cl. 562-448.000.

JENAer Glaswerk Schott & Gen.: *See—*
Kristen, Klaus; and Scheidler, Herwig, 4,130,104, Cl. 126-39.00J.

Jeslis, Jerome: *See—*
Sessions, Robert W.; Jeslis, Jerome; and Rodzen, Richard A., 4,130,119, Cl. 128-325.000.

Johns-Manville Corporation: *See—*
Cerny, Ronald N.; Peters, Walter B.; Sadler, Thomas H.; Rodrigo, Peter; and Mollick, George M., 4,130,140, Cl. 138-149.000.

Johnson, George V.: *See—*
Overman, John W.; and Johnson, George V., 4,130,352, Cl. 353-79.000.

Johnson & Johnson: *See—*
Sung, Pei; Klaus, Irving; and Lee-You, James, 4,129,944, Cl. 32-8.000.

Johnson, Matthey & Co., Limited: *See—*
Collier, Owen N.; and Hackett, Stephen J., 4,130,506, Cl. 252-438.000.

Jones, Marvin R., to Cameron Iron Works, Inc. Underwater Christmas tree. 4,130,161, Cl. 166-337.000.

Jones, Richard H., to Standard Oil Company, The. Alkylation process utilizing the hydrocarbon phase from a reactor for condensing a vaporous distillation effluent. 4,130,593, Cl. 260-683.480.

Jones, Robert D., to Intraco, Inc. Feed level monitor and control apparatus. 4,130,223, Cl. 222-55.000.

Jones, Tod A. Fish egg planting device and method. 4,130,086, Cl. 119-3.000.

Jorn, Ernst, to Haldor Topsoe A/S. Process for preparing methane rich gases. 4,130,575, Cl. 260-449.00M.

Joswig, Franz: *See—*
Kussel, Eckhard; Haubold, Heinz G.; Joswig, Franz; and Klatt, Karl H., 4,130,772, Cl. 313-32.000.

Judd, Carl R.; and Snyder, Howard D., Jr., to Borg-Warner Corporation. Sprag clutch assembly. 4,130,191, Cl. 192-41.00A.

Jundt, Werner; Bodig, Bernd; Sohner, Gerhard; Ruf, Walter; Roth, Helmut; and Werner, Peter, to Robert Bosch GmbH. Transistorized ignition system for internal combustion engines. 4,130,101, Cl. 123-148.00E.

Jureit, J. Calvin; Seipos, Andrew G.; and Langevin, William J., to Automated Building Components, Inc. Method and apparatus for joining wooden members using rolled nail strips packed without rolls. 4,129,933, Cl. 29-417.000.

Kaburagi, Katsuhiko; Yamamoto, Yasutaka; and Suzuki, Yutaka, to Sumitomo Metal Industries Limited. NOx depression type burners. 4,130,389, Cl. 431-183.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Yamazaki, Yoshio, 4,129,983, Cl. 58-50.00R.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Mori, Mamoru; and Inukai, Mitsuo, 4,130,252, Cl. 242-107.100.

Kabushiki Kaisha Venoseiyaku oyo Kenkyuso: *See—*
Ueno, Ryuzo; and Matsumoto, Hiroyasu, 4,130,549, Cl. 528-93.000.

Kadowaki, Takashi; Nishimura, Michio; Watanabe, Seiichi; and Abe, Koichi, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for producing chloroprene monomer having a little content of acetaldehyde. 4,130,596, Cl. 260-655.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Densmore, Russell A., 4,130,185, Cl. 188-1.00B.

Kaiser, Heinz W. Wind powered turbine and airfoil construction. 4,130,380, Cl. 416-197.00A.

Kaizerman, Samuel: *See—*
Chang, Eugene Y. C.; and Kaizerman, Samuel, 4,130,542, Cl. 260-45.9KB.

Kajita, Shinichi; Mori, Kenji; and Kitajima, Junichi, to Kawasaki Jukogyo Kabushiki Kaisha. Combustor device of gas turbine engine. 4,129,985, Cl. 60-39.370.

Kalamazoo Conveyor Company: *See—*
Becker, Roger T.; Burns, Donald L.; and Calkins, Stephen P., 4,130,195, Cl. 198-739.000.

Kalberger, Heinz: *See—*
Michel, Wolfgang; and Kalberger, Heinz, 4,130,683, Cl. 428-194.000.

Kaltenbach & Voigt GmbH & Co.: *See—*
Eibofner, Eugen, 4,129,945, Cl. 32-26.000.

Kalwall Corporation: *See—*
Keller, Richard R., 4,129,973, Cl. 52-308.000.

Kam, George H.; and Logan, Robert P., to GTE Sylvania Incorporated. Apparatus for adjusting operating conditions of a cathode ray tube. 4,130,829, Cl. 358-10.000.

Kamath, Vasanth R., to Pennwalt Corporation. Polymerization process using diperoxy ketals as finishing catalysts. 4,130,700, Cl. 526-73.000.

Kamath, Venkatesh: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.

Kamiya, Hajime: *See—*
Onoki, Fumio; and Kamiya, Hajime, 4,130,672, Cl. 427-164.000.

Kaneko, Shiro, to Fuji Photo Film Co., Ltd. Ball valve with orifice. 4,130,128, Cl. 137-269.000.

Kaneko, Yasutoshi: *See—*
Yamada, Takashi; Kaneko, Yasutoshi; and Murakami, Kazuo, 4,130,044, Cl. 84-176.000.

Kanno, Kenichi; Suzuki, Masayuki; and Sato, Yuichi, to Tokyo Shibaura Electric Co., Ltd. Method of evaluating the corrosion rates of metals. 4,130,464, Cl. 204-1.00T.

Kanojia, Ramesh M.: *See—*
Wachter, Michael P.; and Kanojia, Ramesh M., 4,130,556, Cl. 260-236.500.

Kansai Paint Co., Ltd.: *See—*
Kogure, Hideo, 4,130,431, Cl. 106-14.330.
Nakayama, Yasuharu; Watanabe, Tadashi; Nishida, Reiziro; and Enomoto, Satoru, 4,130,526, Cl. 260-29.6RB.
Nakayama, Yasuharu; Watanabe, Tadashi; Nishida, Reiziro; and Enomoto, Satoru, 4,130,529, Cl. 260-29.7UA.

Kao Soap Co., Ltd.: *See—*
Otsuka, Shigeru; Mori, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; Shimoda, Yoshio; Takeuchi, Takashi; Oku, Masakazu; and Mori, Kan, 4,130,668, Cl. 426-287.000.

Kaplan, Sam H.; Libman, Philomena C.; and Wainscott, William E., to Zenith Radio Corporation. Process for making color television screens by electrophoretic deposition. 4,130,472, Cl. 204-181.00N.

Karube, Yukuo, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Brushless DC motor. 4,130,769, Cl. 310-46.000.

Kashima, Kenichi: *See—*
Nakajima, Tadashi; Soda, Yasuji; Kashima, Kenichi; Kudoh, Haruyoshi; and Miyamoto, Akira, 4,130,571, Cl. 260-403.000.

Katagiri, Masayoshi; and Kizaki, Ziro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Return spring of a drum brake used in a vehicle. 4,130,189, Cl. 188-328.000.

Kates, James M.; and Berkovitz, Robert A., to Teledyne, Inc. Loudspeaker system equalization. 4,130,726, Cl. 179-1.00D.

Kates, James M., to Teledyne, Inc. Loudspeaker equalization. 4,130,727, Cl. 179-1.00D.

Kato, Eiichi: *See—*
Sugiyama, Masatoshi; and Kato, Eiichi, 4,130,430, Cl. 96-84.00A.

Katoh, Takeshi: *See—*
Okada, Shigeichi; and Katoh, Takeshi, 4,130,100, Cl. 123-139.0BG.

Katsumoto, Kiyoshi; and Nimer, Edward L., to Chevron Research Company. Densification of polypyrrolidone. 4,130,521, Cl. 528-326.000.

Katz, Joel; and Gregory, Eugene H., to Hughes Aircraft Company. Modulation system. 4,130,811, Cl. 332-18.000.

Katz, Jonathon H., to Teradyne, Inc. Slip coupling. 4,130,002, Cl. 64-30.00D.

Kawaguchi, Yutaka: *See—*
Wakasa, Isao; Kawaguchi, Yutaka; and Shono, Hiroaki, 4,130,406, Cl. 65-2.000.

Kawamura, Naoto; Matsumoto, Kazuya; and Kitamura, Takashi, to Canon Kabushiki Kaisha. Scanning optical system including optical system for detecting an information beam. 4,130,339, Cl. 350-6.800.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Kajita, Shinichi; Mori, Kenji; and Kitajima, Junichi, 4,129,985, Cl. 60-39.370.

Keiper KG: *See—*
Kluting, Bernd; and Kutschat, Horst, 4,130,029, Cl. 74-625.000.

Keller, James L., to Union Oil Company of California. Automatic shut-off liquid dispensing nozzle. 4,130,148, Cl. 141-218.000.

Keller, Richard R., to Kalwall Corporation. Joining clamp assembly with overlapping seals for translucent wall panels and the like. 4,129,973, Cl. 52-308.000.

Kelley Company Inc.: *See—*
Rozga, Vincent E., 4,130,275, Cl. 271-251.000.

Kelly, Robert C., to Upjohn Company, The. 9-Deoxy-6,9-epoxymethano-prostaglandin derivatives. 4,130,569, Cl. 260-345.200.

Kendall Company, The: *See—*
Hollister, John H., 4,130,453, Cl. 156-187.000.

Kennedy, Brian G., to Unitek Corporation. Dental crown form. 4,129,946, Cl. 32-63.000.

Kennedy, David J. Hair curler operating device. 4,130,122, Cl. 132-34.00R.

Kennedy, Thomas N.: *See—*
Head, Nephi L.; Hempstead, Robert D.; Kennedy, Thomas N.; and Lieu, Fred Y., 4,130,847, Cl. 360-122.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Kussel, Eckhard; Haubold, Heinz G.; Joswig, Franz; and Klatt, Karl H., 4,130,772, Cl. 313-32.000.
Kussel, Eckhard, 4,130,773, Cl. 313-32.000.

Kessie, Lawrence R., to Cleveland Hardware and Forging Company. Anti-separation latching apparatus. 4,130,310, Cl. 292-340.000.

Kessler, Hartmut, to Siemens Aktiengesellschaft. Process for the manufacture of electrical stack or layer capacitors. 4,129,929, Cl. 29-25.420.

Keuffel & Esser Company: *See—*
Kooi, J. Peter E., 4,130,340, Cl. 350-79.000.

Khlopkov, Leonid P.: *See—*
Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Khlopkov, Leonid P.; Nesterovsky, Sergei G.; Starun, Andrei I.; Mironov, Viktor D.; Dibrov, Gennady D.; and Panasenko, Anatoly A., 4,130,439, Cl. 106-67.000.

Kiefer, Jurg: *See—*
Haug, Theobald; Kiefer, Jurg; and Renner, Alfred, 4,130,564, Cl. 260-326.260.

Kijima, Shizumasa; Shionoya, Hiroshi; Hamamura, Kimio; Arai, Haruyoshi; and Koyanagi, Nozomu, to Eisai Co., Ltd. 5-Fluorouracil derivatives and antitumor preparations containing the same. 4,130,648, Cl. 424-251.000.

Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, to Eisai Co., Ltd. Polyprenyl carboxylic acid compound and hypotensive agent containing it as active ingredient. 4,130,659, Cl. 424-312.000.

Kiko, Frederick J.: *See—*
Chambers, Charles W., Jr.; Kiko, Frederick J.; and Kretschmann, Robert J., 4,130,735, Cl. 179-16.00F.

Kikugawa, Kiyomi; and Minoshima, Kyoko, to Terumo Corporation. Method of separating blood cells components. 4,130,642, Cl. 424-101.000.

Kilgus, Donald C., deceased; and by Kilgus, Marjorie M., executrix. Vehicle tie-down hook assembly for railway cars. 4,130,067, Cl. 105-368.00R.

Kilgus, Marjorie M., executrix: *See—*
Kilgus, Donald C., deceased; and Kilgus, Marjorie M., executrix, 4,130,067, Cl. 105-368.00R.

Killy, Earl J., to Olinkraft, Inc. One-piece carrier partition. 4,130,235, Cl. 229-15.000.

Kimura, Koya; Machi, Shinji; and Matunaga, Shigetugu, to Toshiba Kikai Kabushiki Kaisha. Automatic sewing machine. 4,130,073, Cl. 112-121.120.

Kinetronic Industries: *See—*
D'Antonio, Nicholas F.; and Bates, Richard L., 4,130,296, Cl. 280-612.000.

King, George E.: *See—*
Fast, Clarence R.; and King, George E., 4,130,165, Cl. 166-279.000.

Kinney, David W., to Union Insulating Company. Electrical wiring box. 4,130,335, Cl. 339-122.00R.

Kinoshita, Tsuneo; and Yamazaki, Isamu, to Tokyo Shibaura Electric Co., Ltd. Microprogram controlled system. 4,130,869, Cl. 364-200.000.

Kirkby, Anthony D.: *See—*
Cook, Alan J.; Brooks, Norman; and Kirkby, Anthony D., 4,130,150, Cl. 144-2.00R.

Kirkpatrick, Conilee G.; and Parks, Harold G., to General Electric Company. Methods of gray scale recording and archival memory target produced thereby. 4,130,891, Cl. 365-105.000.

Kishi, Yoshio: *See—*
Amano, Kenichi; Suzuki, Yutaka; and Kishi, Yoshio, 4,130,848, Cl. 360-132.000.

Kita, Atsushi: *See—*
Shimizu, Akihiko; and Kita, Atsushi, 4,130,704, Cl. 526-217.000.

Kitajima, Junichi: *See—*
Kajita, Shinichi; Mori, Kenji; and Kitajima, Junichi, 4,129,985, Cl. 60-39.370.

Kitamura, Kazuhiko: *See—*
Inada, Masami; and Kitamura, Kazuhiko, 4,130,267, Cl. 251-61.200.

Kitamura, Takashi: *See—*
Kawamura, Naoto; Matsumoto, Kazuya; and Kitamura, Takashi, 4,130,339, Cl. 350-6.800.

Kitsuda, Yoshihiro; and Kouyama, Takahisa, to Matsushita Electric Works, Ltd. Phenol-formaldehyde composition useful as a raw material for the preparation of phenolic resins. 4,130,550, Cl. 260-29.300.

Kiwala, Jacob: *See—*
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,130,508, Cl. 252-522.000.

Kizaki, Ziro: *See—*
Katagiri, Masayoshi; and Kizaki, Ziro, 4,130,189, Cl. 188-328.000.

Klaszky, Fred E.: *See—*
Cogswell, John A.; Klaszky, Fred E.; and Jacobs, Anthony S., 4,130,207, Cl. 214-6.00D.

Klatt, Karl H.: *See—*
Kussel, Eckhard; Haubold, Heinz G.; Joswig, Franz; and Klatt, Karl H., 4,130,772, Cl. 313-32.000.

Klaus, Irving: *See—*
Sung, Pei; Klaus, Irving; and Lee-You, James, 4,129,944, Cl. 32-8.000.

Klavir, Samuel N., to Envirotech Corporation. Duct swivel joint. 4,130,463, Cl. 202-263.000.

Klimpel, Richard R.: *See—*
Meyer, Wilfred C.; and Klimpel, Richard R., 4,130,401, Cl. 44-51.000.

Klinger, Lance T., to Xerox Corporation. Method and means for tracking magnetic tracks. 4,130,844, Cl. 360-77.000.

Klink, Jerome P.: *See—*
Hendrix, Ronald W.; Klink, Jerome P.; and Dunn, John W., 4,130,248, Cl. 242-18.00G.

Kloeckner Ionon GmbH: *See—*
Oppel, Werner, 4,130,762, Cl. 250-531.000.

Kluting, Bernd; and Kutschat, Horst, to Keiper KG. Drive arrangement for moving a glass panel of a window of a vehicle. 4,130,029, Cl. 74-625.000.

Knight Engineering & Molding Company: *See—*
McKirnan, Robert A., 4,130,220, Cl. 220-284.000.

Knop, Karl, to RCA Corporation. Fine-line diffractive subtractive color filters. 4,130,347, Cl. 350-162.00R.

Knudson, M. Theresa. Animal walker. 4,130,091, Cl. 119-102.000.

Knulle, Helmut; and Pieschke, Harald, to Schmidt'sche Heissdampf-GmbH. Oval header heat exchanger and method of producing the same. 4,130,398, Cl. 29-157.400.

Knutson, Gerald R.; and Shidler, Karl A., to International Business Machines Corporation. Method of making grounded transducer for magnetic record disks. 4,129,937, Cl. 29-603.000.

Kobashi, Toshiyuki; Shiota, Hirotaka; and Umetani, Haruki, to Japan Exlan Company Limited. Stable aqueous emulsion of acrylonitrile polymer, its production and dyeability improving agent comprising such emulsion. 4,130,525, Cl. 260-29.6AN.

Kobayashi, Toshihiro; and Saika, Tadaaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Installation and method of burning cement raw. 4,130,390, Cl. 432-14.000.

Kochanowski, John E., to General Electric. Preparation of polyester carbonates from polyanhydride ester intermediates. 4,130,548, Cl. 528-197.000.

Kocher, Helmut: *See—*
Handte, Reinhard; Horlein, Gerhard; Kocher, Helmut; and Langeluddeke, Peter, 4,130,413, Cl. 71-90.000.

Kogure, Hideo, to Kansai Paint Co., Ltd. Metal surface treatment liquid and rust preventive paint. 4,130,431, Cl. 106-14.330.

Kogure, Takatoshi: *See—*
Ban, Itsuki; Inoue, Kyoichi; and Kogure, Takatoshi, 4,130,780, Cl. 315-241.00P.

Koh-I-Noor Rapidograph, Inc.: *See—*
Anderka, Gerold, 4,130,444, Cl. 134-96.000.

Kohler Co.: *See—*
Kohler, Herbert V., Jr., 4,130,120, Cl. 128-373.000.

Kohler, Herbert V., Jr., to Kohler Co. Bathing chamber. 4,130,120, Cl. 128-373.000.

Koizumi, Toshimichi, to Olympus Optical Co., Ltd. Medium magnification objective for video disks. 4,130,350, Cl. 350-216.000.

Kojima, Kenji; and Saigusa, Tatsunori, to Hitachi Plant Engineering & Construction. Rotary valve for powdery and granular materials. 4,130,268, Cl. 251-298.000.

Kokinos, Charles C., Jr.: *See—*
Cosco, Robert J.; Kokinos, Charles C., Jr.; and Geleski, Charles J., 4,130,774, Cl. 313-318.000.

Komeno, Taichiro: *See—*
Hamashima, Yoshio; Tsuji, Teruji; Yoshioka, Mitsuru; Narisada, Masayuki; Komeno, Taichiro; Tanida, Hiroshi; and Nagata, Wataru, 4,130,557, Cl. 260-239.00A.

Kone, Elliott H., to Traffic Standard Incorporated. Light-reflective road marker of self-cleaning type. 4,130,370, Cl. 404-11.000.

Kooi, J. Peter E., to Keuffel & Esser Company. Two-speed telescope focusing mechanism. 4,130,340, Cl. 350-79.000.

Kornaker, Walter, to International Standard Electric Corporation. Arrangement for mounting and adjusting a deflection-coil holder for a color-picture tube. 4,130,836, Cl. 358-248.000.

Kornaker, Walter: *See—*
Andre, Wolfram; and Kornaker, Walter, 4,130,837, Cl. 358-248.000.

Korta, John, to Westinghouse Canada Ltd. Vane rotator assembly for a gas turbine engine. 4,130,375, Cl. 415-161.000.

Kouyama, Takahisa: *See—*
Kitsuda, Yoshihiro; and Kouyama, Takahisa, 4,130,550, Cl. 260-29.300.

Koyanagi, Nozomu: *See—*
Kijima, Shizumasa; Shionoya, Hiroshi; Hamamura, Kimio; Arai, Haruyoshi; and Koyanagi, Nozomu, 4,130,648, Cl. 424-251.000.

Kozlov, Alexandr T.: *See—*
Zaboronok, Georgy F.; Efimov, Vladimir E.; and Kozlov, Alexandr T., 4,130,416, Cl. 75-10.00R.

Kozuki, Susumu: *See—*
Ohtaki, Shohei; Nakamoto, Soichi; Iwashita, Tomonori; Watanabe, Yoshiaki; and Kozuki, Susumu, 4,130,355, Cl. 354-33.000.

Kraft, Joseph K., to Westinghouse Electric Corp. Transportation apparatus. 4,130,192, Cl. 198-327.000.

Kramer, Alois: *See—*
Schepers, Bernhard; Hellinghausen, Heinz; and Kramer, Alois, 4,130,402, Cl. 51-309.00A.

Kramer, Irvin R., to United States of America, Navy. Antifouling coating for aluminum structures. 4,130,466, Cl. 204-38.00A.

Krause, Joachim: *See—*
Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,130,502, Cl. 252-299.000.

Krauss-Maffei Aktiengesellschaft: *See—*
Schiele, Herbert, 4,130,479, Cl. 209-395.000.

Kretschmann, Robert J.: *See—*
Chambers, Charles W., Jr.; Kiko, Frederick J.; and Kretschmann, Robert J., 4,130,735, Cl. 179-16.00F.

Kristen, Klaus; and Scheidler, Herwig, to JENAer Glaswerk Schott & Gen. Glow wire ignition with on/off and hot warning means for gas heated stove. 4,130,104, Cl. 126-39.00J.

Kristiansen, Odd: *See—*
Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, 4,130,655, Cl. 424-304.000.

Kruger, Hans-Rudolf: *See—*
Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,130,414, Cl. 71-90.000.

Kryoflo, Inc.: *See—*
Whitaker, Ritchie W., 4,130,285, Cl. 277-12.000.

Ku, Paul H. Y. Instant-cooling ice-maker air conditioner. 4,129,994, Cl. 62-179.000.

Kubota, Tatsushi: *See—*
Yasumatsu, Jun; Masuda, Noriyuki; and Kubota, Tatsushi, 4,130,254, Cl. 242-107.100.

Kucenty, Jerzy. Compressor valve. 4,130,131, Cl. 137-512.100.

Kudoh, Haruyoshi: *See—*
Nakajima, Tadashi; Soda, Yasuji; Kashima, Kenichi; Kudoh, Haruyoshi; and Miyamoto, Akira, 4,130,571, Cl. 260-403.000.

Kulig, Frank M.; and Nealon, Frank H., to J. M. Ney Company, The. Centrifugal casting machine. 4,130,158, Cl. 164-289.000.

Kulma, Clarence O., to Microdata Corporation. Disc cabinet recirculating air flow system. 4,130,845, Cl. 360-97.000.

Kulsa, Peter; Hoff, Dale R.; and Mrozik, Helmut H., to Merck & Co., Inc. Substituted benzoylacrylanilides. 4,130,661, Cl. 424-324.000.

Kunert, Peter: *See—*
Breuer, Friedrich; Duderstadt, Gunter; Dresler, Werner; Fichte, Rudolf; Kunert, Peter; and Nassauer, Gerd, 4,130,417, Cl. 75-60.000.

Kunkle, Robert J. Permanent refrigerant dehydrator. 4,129,997, Cl. 62-475.000.

Kuntzel, Heiner: *See—*
Dubs, Paul; and Kuntzel, Heiner, 4,130,562, Cl. 260-302.00S.

Kusaka, Yukio: *See—*
Watanabe, Akira; Kusaka, Yukio; and Suzuki, Yoshihiro, 4,130,438, Cl. 106-56.000.

Kusper, Leroy F.: *See—*
Finley, Lloyd D.; and Kusper, Leroy F., 4,130,049, Cl. 91-445.000.

Kussel, Eckhard; Haubold, Heinz G.; Joswig, Franz; and Klatt, Karl H., to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Liquid-cooled rotary anode for an X-ray tube. 4,130,772, Cl. 313-32.000.

Kussel, Eckhard, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. X-ray tube with liquid-cooled rotary anode. 4,130,773, Cl. 313-32.000.

Kutschat, Horst: *See—*
Kluting, Bernd; and Kutschat, Horst, 4,130,029, Cl. 74-625.000.

Kyushu Taikarenga Kabushiki Kaisha: *See—*
Watanabe, Akira; Kusaka, Yukio; and Suzuki, Yoshihiro, 4,130,438, Cl. 106-56.000.

Lader, Leon J.: *See—*
Block, Kenneth A.; and Lader, Leon J., 4,130,059, Cl. 102-34.400.

LaForest, James J., to General Electric Company. Power line carrier noise elimination. 4,130,861, Cl. 363-39.000.

Lahiff, John E.: *See—*
Bowler, Lauren L.; and Lahiff, John E., 4,130,095, Cl. 123-32.0EE.

Lai, Winston. Sun-cut glass clamping device for automobiles. 4,130,317, Cl. 296-97.00R.

Lamb, Frank, to Ciba-Geigy AG. Polyester plasticizers. 4,130,532, Cl. 260-31.600.

Lamb, Frank, to Ciba-Geigy AG. Polyester plasticizers. 4,130,533, Cl. 260-31.600.

Lane, Richard H.: *See—*
Balph, Thomas J.; and Lane, Richard H., 4,130,878, Cl. 364-758.000.

Lane, William G. Fluid distribution system. 4,130,137, Cl. 137-884.000.

Lang, Rudolf; and Schwarz, Gerhard, to Carl Zeiss Stiftung. Photographic camera with interchangeable lens. 4,130,358, Cl. 354-289.000.

Lang, Winfried: *See—*
Braunsperger, Johann; Lang, Winfried; and Zainer, Thorgard, 4,130,632, Cl. 423-342.000.

Lange, Frederick F.: *See—*
Miller, Donald G.; and Lange, Frederick F., 4,130,157, Cl. 164-132.000.

Langeluddeke, Peter: *See—*
Handte, Reinhard; Horlein, Gerhard; Kocher, Helmut; and Langeluddeke, Peter, 4,130,413, Cl. 71-90.000.

Langevin, William J.: *See—*
Jureit, J. Calvin; Seipos, Andrew G.; and Langevin, William J., 4,129,933, Cl. 29-417.000.

Langley, Allie B. Spring mounted support for barstock. 4,130,035, Cl. 82-38.00A.

Langley, Marvin A. Assembly for cleaning and packing cured tobacco. 4,130,055, Cl. 100-91.000.

Langlie, Howard; and Berg, Albert T., Jr. Funnel with spout extension support. 4,130,147, Cl. 141-98.000.

Lanton, Seymour, to ILC Data Device Corporation. Apparatus for

reducing the scale factor variation for digital resolver type converters and the like. 4,130,875, Cl. 364-603.000.
Larive, David G. Portable cargo decks. 4,130,075, Cl. 114-85.000.
Larkin, William A., to M&T Chemicals Inc. Process of applying tin oxide on glass using butyltin trichloride. 4,130,673, Cl. 427-255.000.
Lauko, John W. Sound absorbing device. 4,130,682, Cl. 428-116.000.
Law, Joseph P.; and Mack, Alfred R., to Singer Company, The. Arm top cover hinge for sewing machines. 4,129,922, Cl. 16-139.000.
Lazarus, Stanley D.; and Chakravarti, Kalidas, to Allied Chemical Corporation. Production of thermally stabilized polyester. 4,130,541, Cl. 260-45.80A.
Leber, Ralph E.; and Baughman, Robert O. Horseshoe pitching game apparatus. 4,130,281, Cl. 273-100.000.
Lednicer, Daniel, to Upjohn Company, The. Polycycloanilines. 4,130,561, Cl. 546-204.000.
Lee, Frank; Allan, James; and Fearnley, Charles, to Ciba-Geigy AG. Detergent compositions. 4,130,498, Cl. 252-99.000.
Lee, Harry T., to Lockheed Missiles & Space Company, Inc. Analog audio signal bandwidth compressor. 4,130,734, Cl. 179-15.55R.
Lee, Hsi L.: *See—*
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,130,713, Cl. 548-303.000.
Lee, Robert. Adjustable sleeve for artists paint brushes. 4,129,918, Cl. 15-169.000.
Lee-You, James: *See—*
Sung, Pei; Klaus, Irving; and Lee-You, James, 4,129,944, Cl. 32-8.000.
Leighton, Betty: *See—*
Leighton, John D., 4,130,027, Cl. 74-512.000.
Leighton, John D., to Leighton, Betty, a part interest. Resilient lever assembly. 4,130,027, Cl. 74-512.000.
Leiser, Manfred; Wegehaupt, Karl-Heinrich; and Marsch, Wilhelm, to Wacker-Chemie GmbH. Adhesive compositions. 4,130,707, Cl. 528-15.000.
Lemonde, Jean-Louis, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Connector for optical fibres. 4,130,344, Cl. 350-96.210.
Lepert, Andre, to Exxon Research & Engineering Co. Petroleum resins containing vinyl norbornene or tetrahydroindene. 4,130,701, Cl. 526-76.000.
Lesh, Harvey B., Jr.: *See—*
Edwards, David V.; Lesh, Harvey B., Jr.; and Phillips, Ronald W., II, 4,129,910, Cl. 9-42.000.
Leute, Richard K.: *See—*
Rubenstein, Kenneth E.; and Leute, Richard K., 4,130,462, Cl. 195-103.50A.
Lever Brothers Company: *See—*
Oneto, Francis E. J.; Benzoni, Andre J. E.; Poret, Jacques L.; and Simon, Fernand B., 4,130,497, Cl. 252-89.00R.
Levijoki, David H., to Globe-Union Inc. Thick-film circuit module including a monolithic ceramic cross-over device. 4,130,722, Cl. 174-68.500.
Levin, Efim M.; Sysoev, Vladimir P.; Rudenko, Valery A.; and Pomazan, Oleg K. Impeller of axial-flow fan. 4,130,381, Cl. 416-196.00R.
Levine, Eli: *See—*
Rybny, Charles B.; and Levine, Eli, 4,130,518, Cl. 260-22.0CB.
Levy, Albert: *See—*
Canard, Pierre; and Levy, Albert, 4,130,691, Cl. 428-511.000.
Levy, Leonard R.: *See—*
Dutkewych, Oleh B.; Gaputis, Charles A.; Gulla, Michael; and Levy, Leonard R., 4,130,454, Cl. 156-659.000.
Lewallyn, Michael A. Carpet sample beveling apparatus and method. 4,130,048, Cl. 90-18.000.
Lewis, Mary E. Vent window lock assembly. 4,130,309, Cl. 292-258.000.
Li, Jorge P.: *See—*
Becker, Frank C.; and Li, Jorge P., 4,130,433, Cl. 106-15.00R.
Libman, Philomena C.: *See—*
Kaplan, Sam H.; Libman, Philomena C.; and Wainscott, William E., 4,130,472, Cl. 204-181.00N.
Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Bachle, Erich; and Clauss, Hermann, 4,130,826, Cl. 357-34.000.
Lien, Larry A.; and Zollinger, J. Lamar, to Minnesota Mining and Manufacturing Company. Abrasion resistant coatings cured in the presence of PF_5, SbF_5, or $HSbF_6$. 4,130,690, Cl. 428-412.000.
Lieu, Fred Y.: *See—*
Head, Nephi L.; Hempstead, Robert D.; Kennedy, Thomas N.; and Lieu, Fred Y., 4,130,847, Cl. 360-122.000.
Liftomatic Material Handling, Inc.: *See—*
Gatilao, Lamberto S., 4,130,212, Cl. 214-653.000.
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Perfume compositions containing cyclohexadiene derivatives. 4,130,508, Cl. 252-522.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Substituted norbornane derivatives. 4,130,587, Cl. 260-586.00G.
Lill, Melvin H.; and Wiederrich, James L., to FMC Corporation. Apparatus for determining steering positions of the front wheels of a vehicle. 4,130,362, Cl. 356-152.000.
Linde AG: *See—*
Hummer, Roland; Thury, Wolfgang; Westerholt, Wilfried; Hollerling, Gundolf; and Strigl, Reinhard, 4,130,419, Cl. 75-130.00R.
Linder, Ernst; Wossner, Gunter; Maurer, Helmut; and Rieger, Franz, to Robert Bosch GmbH. Method and apparatus for reducing the toxic components in exhaust gas. 4,130,098, Cl. 123-119.00A.
Lindman, Borje L.; and Stromer, Carl-Axel, to Telefonaktiebolaget L M Ericsson. Switch actuator for one-piece telephone. 4,130,742, Cl. 179-167.000.
Lindquist, Everet F., to University of Iowa Research Foundation. Simulated fairway surface for golf apparatus. 4,130,283, Cl. 273-195.00A.
Lines, Malcolm E.: *See—*
Glass, Alastair M.; Lines, Malcolm E.; and Nassau, Kurt, 4,130,694, Cl. 429-193.000.
Linford, Robin F. G.: *See—*
Swanstrom, H. Wallace; Campbell, Kenneth C.; and Linford, Robin F. G., 4,130,882, Cl. 364-900.000.
Linstromberg, William J., to Whirlpool Corporation. Snap-action cam for timer switch. 4,130,746, Cl. 200-38.00R.
List, Klaus; and Abendroth, Paul, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Dampening system for printing presses, particularly offset printing presses. 4,130,057, Cl. 101-148.000.
Littell, Harry E., Jr.; and Shorr, Norman, to PPG Industries, Inc. Multilayered safety glass. 4,130,684, Cl. 428-212.000.
Loboda, Robert S., to UOP Inc. Separation and use of a gaseous stripping media in a hydrotreating process. 4,130,476, Cl. 208-212.000.
Lockerby, Charles E.; and Dimmick, W. Scott, to Design Loft Creations, Inc. Soil moisture indicator. 4,130,012, Cl. 73-73.000.
Lockheed Missiles & Space Company, Inc.: *See—*
Lee, Harry T., 4,130,734, Cl. 179-15.55R.
Locqueneux, Rene, to Silec-Semi-Conducteurs. Triac structure having improved triggering sensitivity with single groove extending from gate region. 4,130,828, Cl. 357-39.000.
Loewenthal, Horst, to S I G Schweizerische Industrie-Gesellschaft. Apparatus for sorting, counting and grouping items. 4,130,480, Cl. 209-551.000.
Logan, Robert P.: *See—*
Kam, George H.; and Logan, Robert P., 4,130,829, Cl. 358-10.000.
Lollar, Elizabeth D.: *See—*
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,130,568, Cl. 260-343.210.
Longo, John M.; and Steger, John J., to Exxon Research & Engineering Co. MXY_3 solid lubricants. 4,130,492, Cl. 252-18.000.
Lorain Products Corporation: *See—*
Chambers, Charles W., Jr.; Kiko, Frederick J.; and Kretschmann, Robert J., 4,130,735, Cl. 179-16.00F.
Lorenz, A. Michael. Apparatus for propelling a skate board with wind currents. 4,130,292, Cl. 280-11.37S.
Lorenz, Joachim: *See—*
Wehner, Hermann W.; and Lorenz, Joachim, 4,130,432, Cl. 106-15.00R.
Lotz, Lawrence C., to Whirlpool Corporation. Indicating control structure. 4,130,080, Cl. 116-2.000.
Lowell, Joseph. Game apparatus. 4,130,280, Cl. 273-87.200.
Luboshez, Sergius N. F. Radio-chromic combined absorbing reflecting and transmitting panel. 4,130,351, Cl. 350-263.000.
Lucas Electrical Company Limited, The: *See—*
Hill, William F.; and Clark, Allan E., 4,130,817, Cl. 340-58.000.
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., to United States of America, Agriculture. Physiochemically designed fat compositions from tallow. 4,130,572, Cl. 260-410.700.
Lumenition Limited: *See—*
Ford, Eric H., 4,130,096, Cl. 123-117.00R.
Lundberg, Robert D.; and Thame, Neville G., to Exxon Research & Engineering Co. Multiphase block and graft copolymers comprising a hydrophilic continuous phase and hydrophobic domains. 4,130,517, Cl. 260-29.20N.
Lurie, Evgeny V.: *See—*
Borovikova, Sofia M.; Lurie, Evgeny V.; and Mikhailov, Valery F., 4,130,901, Cl. 366-163.000.
Luthi, Hans, to Fritz Studer AG. Loading arm. 4,130,205, Cl. 214-1.0BB.
Lutz, Charles W.; and Cohen, Leon E., to FMC Corporation. Stable viscous hydrogen peroxide solutions containing a surfactant and a method of preparing the same. 4,130,501, Cl. 252-186.000.
M&T Chemicals Inc.: *See—*
Engelhart, John E.; and McNeil, Maynard W., 4,130,411, Cl. 71-86.000.
Larkin, William A., 4,130,673, Cl. 427-255.000.
Mabrouk, Saied A.; and Morgan, Edward T., to Addressograph-Multigraph Corporation. Lithographic moisture system and method. 4,130,056, Cl. 101-141.000.
Macfield Texturing, Inc.: *See—*
Dillon, Roy E., 4,129,980, Cl. 57-339.000.
Machi, Shinji: *See—*
Kimura, Koya; Machi, Shinji; and Matunaga, Shigetugu, 4,130,073, Cl. 112-121.120.
Machida, Takayasu: *See—*
Nomura, Yasushi; Nakajima, Fumio; Yamada, Kenji; and Machida, Takayasu, 4,129,981, Cl. 58-23.00D.
Machmer, Wilhelm: *See—*
Politzer, Anton; and Machmer, Wilhelm, 4,130,047, Cl. 89-26.000.
Mack, Alfred R.: *See—*
Law, Joseph P.; and Mack, Alfred R., 4,129,922, Cl. 16-139.000.
Maclaren, Arthur H. Unimeter for detection and indication of electric charge variation. 4,130,798, Cl. 324-72.000.
MacMillan, Kenneth T. Tire curing press. 4,130,384, Cl. 425-25.000.

Magruder, William R.: *See—*
Decker, Joseph A., Jr.; Amin, Bipinchandra; and Magruder, William R., 4,130,615, Cl. 264-46.500.

Mainprize, David, to Wickman Machine Tool Sales Limited. Machine guard installations. 4,130,763, Cl. 307-116.000.

Malinowski, John T.: *See—*
Hills, Richard E.; Neely, Frank R.; Neely, Derek K.; and Malinowski, John T., 4,130,217, Cl. 220-226.000.

Mallorca, Salvador C., to Continental Group, Inc., The. Bead supported tab for non-detachable ends. 4,130,219, Cl. 220-270.000.

Manizza, Guelfo A., to Federal Paper Board Co., Inc. Tray type container. 4,130,236, Cl. 229-31.00R.

Mannion, Robert S., to Continental Instrument Corporation. Data storage and retrieval system employing balanced magnetic circuits. 4,130,242, Cl. 235-450.000.

Marchant, Kerford A., Jr.: *See—*
Cerefice, Steven A.; Fields, Ellis K.; Marchant, Kerford A., Jr.; and Paschke, Edward E., 4,130,719, Cl. 528-305.000.

Marcole, Inc.: *See—*
Boyd, Timothy M., 4,130,425, Cl. 96-48.00R.

Marcraft Recreation Corp.: *See—*
Marks, Nathan, 4,130,277, Cl. 273-67.00R.

Marcus, Carol S.: *See—*
Frasher, Wallace G.; Netto, Daniel J.; and Marcus, Carol S., 4,130,757, Cl. 250-336.000.

Marianeschi, Edmondo; Basevi, Sandro; Barisoni, Mario; Marini, Paolo; Borgianni, Carlo; and Ricci Bitti, Roberto, to Centro Sperimentale Metallurgico S.p.A.; and Terni-Societa per l'Industria e l'Elettricita S.p.A. Annealing separator and steel sheet coated with same. 4,130,447, Cl. 148-27.000.

Marini, Paolo: *See—*
Marianeschi, Edmondo; Basevi, Sandro; Barisoni, Mario; Marini, Paolo; Borgianni, Carlo; and Ricci Bitti, Roberto, 4,130,447, Cl. 148-27.000.

Mark, Victor; and Wilson, Phillip S., to General Electric Company. Cyclic siloxane plasticized polycarbonate composition. 4,130,530, Cl. 260-29.1SB.

Marks, Nathan, to Marcraft Recreation Corp. Composite paddle rim. 4,130,277, Cl. 273-67.00R.

Marsch, Wilhelm: *See—*
Leiser, Manfred; Wegehaupt, Karl-Heinrich; and Marsch, Wilhelm, 4,130,707, Cl. 528-15.000.

Martensson, Karl J. G.: *See—*
Sjoholm, Claes B.; and Martensson, Karl J. G., 4,130,053, Cl. 99-466.000.

Martin, Alton E.; White, Warren D.; and Smolik, Samuel L., to Dow Chemical Company, The. Process for producing methylene dianiline. 4,130,588, Cl. 260-570.00D.

Martin, Elmore L.: *See—*
Frazer, August H.; Harris, John F., Jr.; and Martin, Elmore L., 4,130,579, Cl. 260-465.00H.

Martin, Pierre: *See—*
Greuter, Hans; Martin, Pierre; Bellus, Daniel; Gsell, Laurenz; and Meyer, Willy, 4,130,656, Cl. 424-304.000.

Marwil, Stanley J.; and Zuech, Ernest A., to Phillips Petroleum Company. Purification process. 4,130,484, Cl. 210-41.000.

Marx, Arthur F.; and Vos, Cornelis, to Gist-Brocades N.V. A-norandrostane derivatives. 4,130,665, Cl. 424-331.000.

Marzalek, Michael S., to Hewlett-Packard Company. Phase lock stabilized swept frequency signal source. 4,130,808, Cl. 331-14.000.

Masanobu, Morikawa: *See—*
Tanaka, Chiaki; Yoko, Yatabe; and Masanobu, Morikawa, 4,130,603, Cl. 260-860.000.

Maschinenfabrik Gietz AG.: *See—*
Graf, Godi, 4,130,050, Cl. 93-1.00D.

Maschinenfabrik Rissen GmbH: *See—*
Schmidt, Werner, 4,130,234, Cl. 229-1.50B.

Maschinenfabrik Schweiter AG: *See—*
Zehnder, Ulrich, 4,130,038, Cl. 83-175.000.

Mashman, Joseph: *See—*
Carlson, Floyd W.; and Mashman, Joseph, 4,130,259, Cl. 244-83.00F.

Masonite Corporation: *See—*
Moore, Gregory R.; and Fischer, Craig A., 4,130,458, Cl. 162-159.000.

Massachusetts Institute of Technology: *See—*
Dennis, Jack B., 4,130,885, Cl. 364-900.000.

Masuda, Noriyuki: *See—*
Yasumatsu, Jun; Masuda, Noriyuki; and Kubota, Tatsushi, 4,130,254, Cl. 242-107.100.

Matier, William L.; and Comer, William T., to Mead Johnson & Company. Styrylamidines. 4,130,663, Cl. 424-326.000.

Matrix Toys, Inc.: *See—*
Gabriel, Richard J., 4,129,975, Cl. 52-648.000.

Matsuda, Takashi, to Tokyo Shibaura Electric Co., Ltd. Electron beam exposure apparatus. 4,130,761, Cl. 250-492.00A.

Matsumoto, Hiroyasu: *See—*
Ueno, Ryuzo; and Matsumoto, Hiroyasu, 4,130,549, Cl. 528-93.000.

Matsumoto, Kazuya: *See—*
Kawamura, Naoto; Matsumoto, Kazuya; and Kitamura, Takashi, 4,130,339, Cl. 350-6.800.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ichiyanagi, Takashi; Akiyama, Takashige; and Otoda, Ichizo, 4,130,676, Cl. 427-358.000.
Tanaka, Junzo; Orita, Masatomo; and Urashima, Chikao, 4,130,749, Cl. 219-10.55B.

Matsushita Electric Works, Ltd.: *See—*
Kitsuda, Yoshihiro; and Kouyama, Takahisa, 4,130,550, Cl. 260-29.300.

Matt Tool Corporation: *See—*
Matthews, Loren A., 4,130,037, Cl. 83-56.000.

Matthews, Loren A., to Matt Tool Corporation. Shear for cutting sheet material and method of use. 4,130,037, Cl. 83-56.000.

Mattis, Donald J.: *See—*
Horwitt, Laurence G.; Mattis, Donald J.; and Greenberger, Harry, 4,130,815, Cl. 338-282.000.

Matunaga, Shigetugu: *See—*
Kimura, Koya; Machi, Shinji; and Matunaga, Shigetugu, 4,130,073, Cl. 112-121.120.

Maurer, Helmut: *See—*
Linder, Ernst; Wossner, Gunter; Maurer, Helmut; and Rieger, Franz, 4,130,098, Cl. 123-119.00A.

Maus, Otfrid, to Schenck-Auto-Service Geraete GmbH. Portable bearing support. 4,130,020, Cl. 73-457.000.

Mayer, William J.: *See—*
Allaire, William P.; Mayer, William J.; and Zambetis, Thomas A., 4,130,787, Cl. 318-565.000.

Mazeau, Jean P.; and Seward, Thomas P., III, to Corning Glass Works. Photochromic glasses suitable for simultaneous heat treatment and shaping. 4,130,437, Cl. 106-54.000.

MCA Disco-Vision, Inc.: *See—*
Jarsen, Manfred H., 4,130,620, Cl. 264-225.000.

McCallister, Charles W.: *See—*
Heuer, Dale A.; McCallister, Charles W.; and Schloss, Phillip C., 4,130,868, Cl. 364-200.000.

McCallum, William J. P. Ladder support system. 4,130,181, Cl. 182-169.000.

McCullough, Timothy L., to Minnesota Mining and Manufacturing Company. Circuitry for a facsimile receiver for regeneration of carrier for an amplitude modulated suppressed carrier signal. 4,130,839, Cl. 358-281.000.

McDonald, Michael D.; and Pleskunas, Stanley A. Soft deck surfboard. 4,129,911, Cl. 9-310.00E.

McDonnell Douglas Corporation: *See—*
Allaire, William P.; Mayer, William J.; and Zambetis, Thomas A., 4,130,787, Cl. 318-565.000.

McGee, David L., to Plymak Company, Inc. Veneer clipper. 4,130,041, Cl. 83-617.000.

McGill Manufacturing Company, Inc.: *See—*
Resh, John S., 4,130,747, Cl. 200-67.00D.

McGinniss, Vincent D., to SCM Corporation. Aqueous coating composition from a mercaptan containing polymer and a bis-maleimide. 4,130,469, Cl. 204-159.160.

McGinniss, Vincent D., to SCM Corporation. Aqueous coating composition and process. 4,130,522, Cl. 260-29.2TN.

McGuire, Walter R.: *See—*
Hamilton, Alan D.; Peterson, Gregory P.; and McGuire, Walter R., 4,130,451, Cl. 156-86.000.

McKirnan, Robert A., to Knight Engineering & Molding Company. Tamperproof cover. 4,130,220, Cl. 220-284.000.

McLaughlin, Jack E., to Andermac, Inc. Cartridge dispenser for medicating douche. 4,130,118, Cl. 128-229.000.

McMackins, Dudley E.: *See—*
Hobbs, Charles F.; and McMackins, Dudley E., 4,130,590, Cl. 260-585.00D.

McMahon, Donald H., to Sperry Rand Corporation. Passive optical channel crossover, switch and bend structure. 4,130,342, Cl. 350-96.140.

McMullen, John C.: *See—*
Friedlander, Charles B.; and McMullen, John C., 4,130,708, Cl. 528-28.000.

McNeil, Maynard W.: *See—*
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Mead Johnson & Company: *See—*
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Mecafina S.A.: *See—*
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Mecks, Karl: *See—*
Schindel, Hugo; and Mecks, Karl, 4,130,194, Cl. 198-397.000.

Megles, John E., Jr.: *See—*
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Meins, Peter: *See—*
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Melco: *See—*
Breen, Barry C., 4,130,737, Cl. 179-18.0AD.

Melendres, Carlos A.; and Siegel, Stanley, to United States of America, Energy. Lithium-aluminum-magnesium electrode composition. 4,130,500, Cl. 252-182.100.

Melquist, John L.: *See—*
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Melton, Leoda. Auxiliary wood burning furnace. 4,130,105, Cl. 126-110.00R.

Mencenberg, Fred: *See—*
Hauser, Karl V.; and Mencenberg, Fred, 4,130,436, Cl. 106-38.900.

Mender, Adolf; and Schmidt, Horst, to Videoprint Gesellschaft fur Industrie-Fernsehen mbH. Method of and apparatus for the production of photographic stills. 4,130,834, Cl. 358-127.000.

Merck & Co., Inc.: *See*—
Holly, Frederick W.; Paleveda, William J.; Strachan, Robert G.; and Veber, Daniel F., 4,130,554, Cl. 260-112.50R.
Kulsa, Peter; Hoff, Dale R.; and Mrozik, Helmut H., 4,130,661, Cl. 424-324.000.
Merck Patent Gesellschaft mit: *See*—
Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,130,502, Cl. 252-299.000.
Meredith, James F.; and Williams, Brian, to Smiths Industries Limited. Control systems. 4,130,241, Cl. 235-307.000.
Merle, Gerard: *See*—
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, 4,130,703, Cl. 526-173.000.
Merrell Toraude et Compagnie: *See*—
Giroux, Eugene L.; Prakash, Nellikunja J.; and Schechter, Paul J., 4,130,653, Cl. 424-274.000.
Merrill, Duane F.; and Cooke, Richard C., Jr., to General Electric Company. Silanol-free resins. 4,130,599, Cl. 260-825.000.
Merrill, Richard B.; and Yee, Yen S., to International Business Machines Corporation. Loop organized serial-parallel-serial memory storage system. 4,130,894, Cl. 365-183.000.
Merriman, Franklin. Synthetic resin ratchet winch. 4,130,271, Cl. 254-150.00R.
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Shaub, Harold; and Metro, Stephen J., 4,130,494, Cl. 252-32.500.
Meyer, Victor, Jr.: *See*—
Bolgiano, Duane R.; Benjamin, Joel M., Jr.; and Meyer, Victor, Jr., 4,130,731, Cl. 179-2.0EB.
Meyer, Wilfred C., to Dow Chemical Company, The. Combustible fuel slurry and method of preparing same. 4,130,400, Cl. 44-51.000.
Meyer, Wilfred C.; and Klimpel, Richard R., to Dow Chemical Company, The. Combustible and mobile fuel slurry and method of preparing same. 4,130,401, Cl. 44-51.000.
Meyer, Willy: *See*—
Drabek, Jozef; Farooq, Saleem; Gsell, Laurenz; Kristiansen, Odd; and Meyer, Willy, 4,130,655, Cl. 424-304.000.
Greuter, Hans; Martin, Pierre; Bellus, Daniel; Gsell, Laurenz; and Meyer, Willy, 4,130,656, Cl. 424-304.000.
Meyerhofer, Wilfred L., Jr.: *See*—
Arndt, Richard L.; Meyerhofer, Wilfred L., Jr.; and Steinbauer, David M., 4,130,756, Cl. 235-474.000.
Michel, Wolfgang; and Kalberger, Heinz, to Hoechst Aktiengesellschaft. Sponge-like material having improved scrubbing and cleaning ability. 4,130,683, Cl. 428-194.000.
Micheli, Paul L., to United States of America, Air Force. Flared sonic end nozzle velocity coupling test burner. 4,130,011, Cl. 73-35.000.
Microdata Corporation: *See*—
Kulma, Clarence O., 4,130,845, Cl. 360-97.000.
Midolo, Lawrence L. System for thermal isolating of brakes. 4,130,187, Cl. 188-264.0CC.
Midwest Bindery Enterprises, Inc.: *See*—
Fox, Philip R., 4,130,197, Cl. 206-45.260.
Mikhailov, Valery F.: *See*—
Borovikova, Sofia M.; Lurie, Evgeny V.; and Mikhailov, Valery F., 4,130,901, Cl. 366-163.000.
Miller, Donald G.; and Lange, Frederick F., to Westinghouse Electric Corp. Silicon nitride (SI_3N_4) leachable ceramic cores. 4,130,157, Cl. 164-132.000.
Miller, John W. V.; and Trogdon, Ray L., to Owens-Illinois, Inc. Slow rise time write pulse for gas discharge device. 4,130,779, Cl. 315-169.0TV.
Miller, Ralph L.: *See*—
Chandler, Curtis S.; and Miller, Ralph L., 4,130,329, Cl. 339-75.00M.
Miller, Robert S.; and Doyle, Francis J., to Stauffer Chemical Company. Method of treating a polymer latex to remove unreacted monomer by treatment in a column. 4,130,527, Cl. 260-29.60R.
Miller, Stewart E.; and Ogawa, Kinichiro, to Bell Telephone Laboratories, Incorporated. Coupling arrangements between a light-emitting diode and an optical fiber waveguide and between an optical fiber waveguide and a semiconductor optical detector. 4,130,343, Cl. 350-96.150.
Millham, Ernest H.; Scaccia, Ralph J.; and Villante, Francis J., to International Business Machines Corporation. Dynamic error location. 4,130,240, Cl. 235-303.100.
Milner, David J.: *See*—
Hewertson, Warren; Holland, David; and Milner, David J., 4,130,598, Cl. 260-680.00R.
Milton Roy Company: *See*—
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Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,130,659, Cl. 424-312.000.
Minekawa, Shigeo: *See*—
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Fanselow, Dan L.; and Ersfeld, Dean A., 4,130,760, Cl. 250-474.000.
Lien, Larry A.; and Zollinger, J. Lamar, 4,130,690, Cl. 428-412.000.
McCullough, Timothy L., 4,130,839, Cl. 358-281.000.
Peterson, Clyde V., 4,130,221, Cl. 220-326.000.
Minolta Camera Kabushiki Kaisha: *See*—
Yamanaka, Akira, 4,130,356, Cl. 354-145.000.
Minoshima, Kyoko: *See*—
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Minott, Edward R.: *See*—
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Mitchell, Henry D., Jr., to Western Electric Co., Incorporated. Methods of and apparatus for assembling connectors with a back plate. 4,129,940, Cl. 29-629.000.
Mitchell, Wylie W.; and Arrowood, Gordon W., to Robdell, Clyde A.; Rodbell, Leonard B.; Rodbell, Paul N.; Rodbell, Sidney P.; and Rodbell, Arthur T., a part interest to each. Twin positive and negative seal pipe fittings. 4,130,302, Cl. 285-113.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mitsubishi Gas Chemical Company, Inc.: *See*—
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Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
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Mitsuhashi, Yasuhiro, to Nippon Gakki Seizo Kabushiki Kaisha. Method of and apparatus for composing approximate sinusoidal waveform. 4,130,876, Cl. 364-721.000.
Mitsui, Zen: *See*—
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Tsinker, Maia G.; Ter-Zakharian, Julya Z.; Oganian, Shushanik G.; Ovakimian, Aram R.; Mndzhoian, Shushanik L.; Mndzhoian, Armenak L., deceased; and Mndzhoian, Alza A., administrator, 4,130,559, Cl. 260-239.100.
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Tsinker, Maia G.; Ter-Zakharian, Julya Z.; Oganian, Shushanik G.; Ovakimian, Aram R.; Mndzhoian, Shushanik L.; Mndzhoian, Armenak L., deceased; and Mndzhoian, Alza A., administrator, 4,130,559, Cl. 260-239.100.
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Moinuddin, Mohammed, to Borg-Warner Corporation. Apparatus for noise suppression in a gear pump. 4,130,383, Cl. 418-78.000.
Molinaro, Giuseppe A.; and Dray, Sheldon, to University of Illinois Foundation. Method for detecting and quantifying antigens. 4,130,634, Cl. 424-8.000.
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Monbaliu, Marcel J.; and Van Poucke, Raphael K., to Agfa-Gevaert, N.V. Silver halide emulsion containing two-equivalent color couplers for yellow. 4,130,427, Cl. 96-56.500.
Monolithic Memories, Inc.: *See*—
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Mononen, Sakari M. Vehicles for taking on, transporting, and discharging a load. 4,130,209, Cl. 214-140.000.
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Anderson, George J.; Desmond, Timothy F.; and Santer, J. Owen, 4,130,692, Cl. 428-524.000.
Barkhuff, Raymond A., Jr., 4,130,605, Cl. 260-876.00R.
Coran, Aubert Y.; and Patel, Raman P., 4,130,534, Cl. 260-33.6AQ.
Coran, Aubert Y.; Das, Balbhadra; and Patel, Raman P., 4,130,535, Cl. 260-33.6AQ.
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Hobbs, Charles F.; and McMackins, Dudley E., 4,130,590, Cl. 260-585.00D.
Sabacky, Milton J., 4,130,410, Cl. 71-86.000.
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Moore, Donald D. Automatic liquid flow control device. 4,130,135, Cl. 137-624.110.
Moore, George G. I., to Riker Laboratories, Inc. Anti-inflammatory method. 4,130,666, Cl. 424-331.000.
Moore, Gregory R.; and Fischer, Craig A., to Masonite Corporation. Product containing alumina trihydrate and a source of B_2O_3 and method. 4,130,458, Cl. 162-159.000.
Moran, Daniel J. Automatic aquarium feeding device. 4,130,089, Cl. 119-51.00R.
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Mori, Mamoru; and Inukai, Mitsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seat belt system. 4,130,252, Cl. 242-107.100.
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Mueller, Peter G.; and Goodrich, Albert S., to Picker Corporation. Ultrasonic sector scanning search unit. 4,130,021, Cl. 73-633.000.
Mulcahy, Harry W., to Amsted Industries Incorporated. Friction side bearing assembly. 4,130,066, Cl. 105-199.0CB.
Muller, Erich; Diederen, Willi; and Shanks, Robin G., to Boehringer Ingelheim GmbH. Antiarrhythmic method of use. 4,130,650, Cl. 424-263.000.
Muller, Werner: *See—*
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Muntz, Ronald L., to Stauffer Chemical Company. Polyester catalyst system and process. 4,130,552, Cl. 528-285.000.
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Murakami, Ryoichi; and Zinnouti, Masahiro, to Nippon Paint Co., Ltd. Process for phosphate conversion coating with treatment of rinse water by reverse osmosis and ion exchange. 4,130,446, Cl. 148-6.15Z.
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Nagaraj, D. R.; and Somasundaran, Ponisseril. Copper flotation with anti-5-nonyl-2-hydroxybenxophenone oxime. 4,130,415, Cl. 75-2.000.
Nagarajan, Ramakrishnan, to Eli Lilly and Company. Pleuromutilin glycoside derivatives. 4,130,709, Cl. 536-17.000.
Nagata, Wataru: *See—*
Hamashima, Yoshio; Tsuji, Teruji; Yoshioka, Mitsuru; Narisada, Masayuki; Komeno, Taichiro; Tanida, Hiroshi; and Nagata, Wataru, 4,130,557, Cl. 260-239.00A.
Nagato, Nobuyuki; and Naito, Taketoshi, to Showa Denko K.K. Process for preparing α, α-dimethylbenzyl isocyanates. 4,130,577, Cl. 260-453.00P.
Nagel, Martin J., to Tenna Corporation. Split-coil speaker with direct coupling. 4,130,725, Cl. 179-1.00A.
Nagesh, Voddarahalli K.; and Fulrath, Richard M., deceased (by Fulrath, Marilyn M., executrix), to United States of America, Energy. Method for preparing a thick film conductor. 4,130,671, Cl. 427-125.000.
Naito, Taketoshi: *See—*
Nagato, Nobuyuki; and Naito, Taketoshi, 4,130,577, Cl. 260-453.00P.
Nakajima, Fumio: *See—*
Nomura, Yasushi; Nakajima, Fumio; Yamada, Kenji; and Machida, Takayasu, 4,129,981, Cl. 58-23.00D.
Nakajima, Tadashi; Soda, Yasuji; Kashima, Kenichi; Kudoh, Haruyoshi; and Miyamoto, Akira, to Nippon Shoji Kaisha, Ltd. Process for preparing 1,2-diacyl-3-glycerylphosphorylcholines. 4,130,571, Cl. 260-403.000.
Nakajima, Toshikazu: *See—*
Hayasaka, Toshimi; and Nakajima, Toshikazu, 4,130,024, Cl. 74-29.000.
Nakajima, Yoshikage: *See—*
Kijima, Shizumasa; Igarashi, Toshiji; Yamatsu, Isao; Hamamura, Kimio; Nakajima, Yoshikage; Minami, Norio; Yamagishi, Youji; and Inai, Yuithi, 4,130,659, Cl. 424-312.000.
Nakamoto, Soichi: *See—*
Ohtaki, Shohei; Nakamoto, Soichi; Iwashita, Tomonori; Watanabe, Yoshiaki; and Kozuki, Susumu, 4,130,355, Cl. 354-33.000.
Nakayama, Yasuharu; Watanabe, Tadashi; Nishida, Reiziro; and Enomoto, Satoru, to Kansai Paint Co., Ltd. Aqueous coating composition. 4,130,526, Cl. 260-29.6RB.
Nakayama, Yasuharu; Watanabe, Tadashi; Nishida, Reiziro; and Enomoto, Satoru, to Kansai Paint Co., Ltd. Aqueous film-forming composition. 4,130,529, Cl. 260-29.7UA.
Narisada, Masayuki: *See—*
Hamashima, Yoshio; Tsuji, Teruji; Yoshioka, Mitsuru; Narisada, Masayuki; Komeno, Taichiro; Tanida, Hiroshi; and Nagata, Wataru, 4,130,557, Cl. 260-239.00A.
Nassau, Kurt: *See—*
Glass, Alastair M.; Lines, Malcolm E.; and Nassau, Kurt, 4,130,694, Cl. 429-193.000.
Nassauer, Gerd: *See—*
Breuer, Friedrich; Duderstadt, Gunter; Dresler, Werner; Fichte, Rudolf; Kunert, Peter; and Nassauer, Gerd, 4,130,417, Cl. 75-60.000.
Nasser, Benny E., Jr.; and Dietz, Richard E., to Phillips Petroleum Company. Two stage activation of fluorided chromium-containing catalyst. 4,130,505, Cl. 252-432.000.
National Can Corporation: *See—*
Sauer, Donald G., 4,130,387, Cl. 425-388.000.
National Institute for Metallurgy, The: *See—*
Evers, Ann P.; Edwards, Roderick I.; and Fieberg, Monika M., 4,130,625, Cl. 423-22.000.
National Machinery Company, The: *See—*
Haines, Allan D., 4,130,005, Cl. 72-360.000.
National Research Development Corporation: *See—*
Grover, John H. H., 4,130,015, Cl. 73-178.00T.
Streat, Michael, 4,130,512, Cl. 521-31.000.
NCR Corporation: *See—*
Bowman, Rodney V.; and Francis, Martin H., 4,130,899, Cl. 365-222.000.
Nealon, Frank H.: *See—*
Kulig, Frank M.; and Nealon, Frank H., 4,130,158, Cl. 164-289.000.
Neary, Joseph F., to Troller Corporation. Diving plane for fishing. 4,129,956, Cl. 43-43.130.
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, to Roussel Uclaf. Novel phenethylamines. 4,130,658, Cl. 424-308.000.
Neely, Derek K.: *See—*
Hills, Richard E.; Neely, Frank R.; Neely, Derek K.; and Malinowski, John T., 4,130,217, Cl. 220-226.000.
Neely, Frank R.: *See—*
Hills, Richard E.; Neely, Frank R.; Neely, Derek K.; and Malinowski, John T., 4,130,217, Cl. 220-226.000.
Neff, Nelson E.; and Thomas, Anthony F., to AMP Incorporated. Solderless connector for terminating a magnet wire or the like. 4,130,331, Cl. 339-97.00R.
Negersmith, Kent M., to Technicon Instruments Corporation. Short sample detection. 4,130,394, Cl. 23-230.00R.
Nelson, Michael E., to Rolls-Royce Limited. Gas turbine engine with anti-icing facility. 4,129,984, Cl. 60-39.09D.
Nelson, Norman A.: *See—*
Bundy, Gordon L.; and Nelson, Norman A., 4,130,721, Cl. 560-121.000.
Nelson, Paul M., to Wilson Industries, Inc. Flow-through mule shoe sub. 4,130,162, Cl. 166-243.000.
Nesterovsky, Sergei G.: *See—*
Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Khlopkov, Leonid P.; Nesterovsky, Sergei G.; Starun, Andrei I.; Mironov, Viktor D.; Dibrov, Gennady D.; and Panasenko, Anatoly A., 4,130,439, Cl. 106-67.000.
Netto, Daniel J.: *See—*
Frasher, Wallace G.; Netto, Daniel J.; and Marcus, Carol S., 4,130,757, Cl. 250-336.000.
Neumann, Hans-Joachim: *See—*
Wagner, Helmut; and Neumann, Hans-Joachim, 4,130,491, Cl. 252-8.55D.

Neumann, Manfred E., to Allis-Chalmers Corporation. Tap changing voltage regulator which eliminates preventive autotransformer. 4,130,789, Cl. 323-43.50R.

Newman, Neil F.: *See—*
Roper, Robert; Newman, Neil F.; and Hous, Pierre, 4,130,519, Cl. 260-23.70H.

Nielsen, Robert L.: *See—*
Gunckel, Thomas L., II; Rovell, Alex; and Nielsen, Robert L., 4,130,892, Cl. 365-154.000.

Niemi, Ilmer I.; and Peterson, Kenneth S., to Conwed Corporation. Ballasted floating barrier boom. 4,129,989, Cl. 405-70.000.

Niemirow, Jerzy. Swimming pool rescue net. 4,129,905, Cl. 4-172.130.

Niimi, Koji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having filter-and-delay loop for tone production. 4,130,043, Cl. 84-1.030.

Nimer, Edward L.: *See—*
Katsumoto, Kiyoshi; and Nimer, Edward L., 4,130,521, Cl. 528-326.000.

Nippi Incorporated: *See—*
Ohtsuka, Kazumasa; Mitsui, Zen; and Wada, Hajime, 4,130,555, Cl. 260-117.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Mitsuhashi, Yasuhiro, 4,130,876, Cl. 364-721.000.
Niimi, Koji, 4,130,043, Cl. 84-1.030.
Yamada, Takashi; Kaneko, Yasutoshi; and Murakami, Kazuo, 4,130,044, Cl. 84-176.000.

Nippon Paint Co., Ltd.: *See—*
Murakami, Ryoichi; and Zinnouti, Masahiro, 4,130,446, Cl. 148-6.15Z.

Nippon Rubber Co., Ltd.: *See—*
Hayashi, Hideki, 4,130,007, Cl. 73-7.000.

Nippon Shoji Kaisha, Ltd.: *See—*
Nakajima, Tadashi; Soda, Yasuji; Kashima, Kenichi; Kudoh, Haruyoshi; and Miyamoto, Akira, 4,130,571, Cl. 260-403.000.

Nippon Soken, Inc.: *See—*
Hattori, Tadashi; and Yamaguchi, Hiroaki, 4,130,797, Cl. 324-65.00P.

Nippondenso Co., Ltd.: *See—*
Akado, Hajime; Ueda, Hiroshi; Yamashita, Akira; and Tamura, Takemasa, 4,130,405, Cl. 55-503.000.
Ohta, Kazuhiro; and Ohshima, Mituzi, 4,130,159, Cl. 165-111.000.
Usami, Kiyoshi, 4,129,995, Cl. 62-217.000.

Nishida, Reiziro: *See—*
Nakayama, Yasuharu; Watanabe, Tadashi; Nishida, Reiziro; and Enomoto, Satoru, 4,130,526, Cl. 260-29.6RB.
Nakayama, Yasuharu; Watanabe, Tadashi; Nishida, Reiziro; and Enomoto, Satoru, 4,130,529, Cl. 260-29.7UA.

Nishimura, Michio: *See—*
Kadowaki, Takashi; Nishimura, Michio; Watanabe, Seiichi; and Abe, Koichi, 4,130,596, Cl. 260-655.000.

Nisper, Kenneth J., to Questor Corporation. Piston ring. 4,130,288, Cl. 277-216.000.

Nissan Motor Company, Limited: *See—*
Aoyama, Syunichi, 4,130,093, Cl. 123-119.00A.

Nitschke, John S. Self-compensating thermocouple reading circuit. 4,130,019, Cl. 73-341.000.

Nitto Boseki Co., Ltd.: *See—*
Wakasa, Isao; Kawaguchi, Yutaka; and Shono, Hiroaki, 4,130,406, Cl. 65-2.000.

Nivin, James E., to American Commercial Barge Line Company. Light-weight, easy-erecting barge hatch cover. 4,130,125, Cl. 135-6.000.

Nomura, Yasushi; Nakajima, Fumio; Yamada, Kenji; and Machida, Takayasu, to Citizen Watch Company Limited. Electronic timepiece. 4,129,981, Cl. 58-23.00D.

Norman, Richard O.; and Frassanito, John R., to Envair, Inc. Viscous liquid dispenser. 4,130,224, Cl. 222-185.000.

Northern Instruments Corporation: *See—*
Boerwinkle, Fred P.; and Szauer, Tadeusz, 4,130,524, Cl. 260-29.6HN.

Northern Telecom Limited: *See—*
Cogan, Fredrick T., 4,130,740, Cl. 179-103.000.

Nose, Shinji; and Tokuda, Shingo, to Osaka Soda Co., Ltd. Self-curable inorganic composition. 4,130,440, Cl. 106-74.000.

Nossen, Edward J.; and Volertas, Vytas F., to RCA Corporation. Unidirectional phase shift keyed communication system. 4,130,802, Cl. 325-30.000.

Nuclear Supreme: *See—*
Waltrip, Owen R., 4,130,483, Cl. 210-40.000.

Nudelman, Boris I.; Sventsitsky, Alexandr S.; Bikbau, Marsel Y.; Prikhozhan, Ada M.; and Ibragimov, Isak M. Cement and process for producing same. 4,130,441, Cl. 106-89.000.

Nutter, Geoffrey, to Ferranti Limited. Data storage system for addressing data stored in adjacent word locations. 4,130,880, Cl. 364-900.000.

Oehr, Klaus H., to British Columbia Research Council. Process for plating lead dioxide. 4,130,467, Cl. 204-57.000.

Oganian, Shushanik G.: *See—*
Tsinker, Maia G.; Ter-Zakharian, Julya Z.; Oganian, Shushanik G.; Ovakimian, Aram R.; Mndzhoian, Shushanik L.; Mndzhoian, Armenak L., deceased; and Mndzhoian, Alza A., administrator, 4,130,559, Cl. 260-239.100.

Ogawa, Kinichiro: *See—*
Miller, Stewart E.; and Ogawa, Kinichiro, 4,130,343, Cl. 350-96.150.

Ohaus Scale Corporation: *See—*
Walker, Richard K., 4,130,624, Cl. 310-328.000.

Ohhinata, Ichiro: *See—*
Okuhara, Shinzi; and Ohhinata, Ichiro, 4,130,767, Cl. 307-252.00T.

Ohoka, Masataka; Yamada, Mitsuko; Shoji, Akio; and Arimoto, Shunji, to Dainippon Ink and Chemicals, Inc. Resin composition for powder paint. 4,130,601, Cl. 260-835.000.

Ohringer, Jack G. Normally closed sewage venting system. 4,129,906, Cl. 4-211.000.

Ohshima, Mituzi: *See—*
Ohta, Kazuhiro; and Ohshima, Mituzi, 4,130,159, Cl. 165-111.000.

Ohta, Kazuhiro; and Ohshima, Mituzi, to Nippondenso Co., Ltd. Heat exchanger. 4,130,159, Cl. 165-111.000.

Ohtaki, Shohei; Nakamoto, Soichi; Iwashita, Tomonori; Watanabe, Yoshiaki; and Kozuki, Susumu, to Canon Kabushiki Kaisha. Photographic camera with an automatic exposure control adapter unit detachably mounted thereon. 4,130,355, Cl. 354-33.000.

Ohtsuka, Kazumasa; Mitsui, Zen; and Wada, Hajime, to Nippi Incorporated. Peptide mixtures derived from collagenous material or gelatin. 4,130,555, Cl. 260-117.000.

Ojalvo, Morris. Warp-restraining device and improvement to beams, girders, arch ribs, columns and struts. 4,129,974, Cl. 52-729.000.

Okada, Hisao: *See—*
Mogi, Takao; and Okada, Hisao, 4,130,804, Cl. 325-464.000.

Okada, Shigeichi; and Katoh, Takeshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Direct-injection spark-ignition engine. 4,130,100, Cl. 123-139.0BG.

Okada, Toshihiko: *See—*
Terasawa, Tadao; and Okada, Toshihiko, 4,130,565, Cl. 260-327.0TH.

Okoshi, Takanori. Holographic viewer system. 4,130,337, Cl. 350-3.760.

Oku, Masakazu: *See—*
Otsuka, Shigeru; Mori, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; Shimoda, Yoshio; Takeuchi, Takashi; Oku, Masakazu; and Mori, Kan, 4,130,668, Cl. 426-287.000.

Okuhara, Shinzi; and Ohhinata, Ichiro, to Hitachi, Ltd. Semiconductor switch. 4,130,767, Cl. 307-252.00T.

Olander, Walter K., to General Electric. Oxidative coupling of phenolic monomers by the programmed addition of complexed manganese catalysts. 4,130,544, Cl. 528-215.000.

Olin Corporation: *See—*
Iacoviello, Alan, 4,130,231, Cl. 227-10.000.

Olinkraft, Inc.: *See—*
Killy, Earl J., 4,130,235, Cl. 229-15.000.

Olschewski, Armin: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 4,130,286, Cl. 277-12.000.

Olsen, James R.; and Forth, Charles R. Bridge game scoring and display computer. 4,130,871, Cl. 364-411.000.

Olson, Harris S., to Caterpillar Tractor Co. Wear strips for earthmoving buckets. 4,129,952, Cl. 37-118.00R.

Olympus Optical Co., Ltd.: *See—*
Hayasaka, Toshimi; and Nakajima, Toshikazu, 4,130,024, Cl. 74-29.000.
Hyakumura, Kazushi, 4,130,349, Cl. 350-216.000.
Koizumi, Toshimichi, 4,130,350, Cl. 350-216.000.

Oneto, Francis E. J.; Benzoni, Andre J. E.; Poret, Jacques L.; and Simon, Fernand B., to Lever Brothers Company. Detergent composition. 4,130,497, Cl. 252-89.00R.

Ono, Masahiko, to Tokyo Shibaura Electric Co., Ltd. Data processor having a circuit structure suitable for fabrication in LSI form. 4,130,866, Cl. 364-200.000.

Ono, Takayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid reservoir. 4,130,222, Cl. 220-373.000.

Onoki, Fumio; and Kamiya, Hajime, to Hoya Lens Co., Ltd. Method for coating anti-reflection film on surface of optical material. 4,130,672, Cl. 427-164.000.

Oppel, Werner, to Kloeckner Ionon GmbH. Arrangement for the automatic heating and adjustment of a treatment temperature for the treatment of workpieces by means of glow discharge. 4,130,762, Cl. 250-531.000.

Optimizer Control Corp.: *See—*
Schweitzer, Paul H.; and Collins, Thomas W., 4,130,863, Cl. 364-105.000.

Orion Machinery & Engineering Corp.: *See—*
Steinhilber, Wilhelm A., 4,130,249, Cl. 242-25.00R.

Orita, Masatomo: *See—*
Tanaka, Junzo; Orita, Masatomo; and Urashima, Chikao, 4,130,749, Cl. 219-10.55B.

Ornstein, Severo M.: *See—*
Heart, Frank E.; Ornstein, Severo M.; Barker, William B.; and Crowther, William R., 4,130,865, Cl. 364-200.000.

Oronzio de Nora Impianti Elettrochimici S.p.A.: *See—*
De Nora, Oronzio; and De Nora, Vittorio, 4,130,468, Cl. 204-98.000.

Ortho Pharmaceutical Corporation: *See—*
Wachter, Michael P.; and Kanojia, Ramesh M., 4,130,556, Cl. 260-236.500.

Orthoband Company, Inc.: *See—*
DeWoskin, Irvin S., 4,130,681, Cl. 428-102.000.

Osaka Soda Co., Ltd.: *See—*
Nose, Shinji; and Tokuda, Shingo, 4,130,440, Cl. 106-74.000.

Ostrander, Walter M.; Scholl, Malcolm M.; Minott, Edward R.; and Smith, Christopher D., to Audioanalyst, Inc. Loudspeaker. 4,130,174, Cl. 181-146.000.

Ostrowski, Carl L., to Federal Screw Works. Voice synthesizer. 4,130,730, Cl. 179-1.0SM.

Ota, Isamu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Kick-up

device for a secondary throttle valve in a diaphragm-type two barrel carburetor. 4,130,608, Cl. 261-23.00A.

Otoda, Ichizo: *See—*
Ichiyanagi, Takashi; Akiyama, Takashige; and Otoda, Ichizo, 4,130,676, Cl. 427-358.000.

Otsuka, Shigeru; Mori, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; Shimoda, Yoshio; Takeuchi, Takashi; Oku, Masakazu; and Mori, Kan, to Kao Soap Co., Ltd.; and Toyo Seikan Kaisha, Ltd. Method for chemically peeling fruits and vegetables. 4,130,668, Cl. 426-287.000.

Ovakimian, Aram R.: *See—*
Tsinker, Maia G.; Ter-Zakharian, Julya Z.; Oganian, Shushanik G.; Ovakimian, Aram R.; Mndzhoian, Shushanik L.; Mndzhoian, Armenak L., deceased; and Mndzhoian, Alza A., administrator, 4,130,559, Cl. 260-239.100.

Overman, John W.; and Johnson, George V., to Bell & Howell Company. Portable microfiche reader with foldup lens and mirror assembly. 4,130,352, Cl. 353-79.000.

Owens-Corning Fiberglas Corporation: *See—*
Hendrix, Ronald W.; Klink, Jerome P.; and Dunn, John W., 4,130,248, Cl. 242-18.00G.

Owens-Illinois, Inc.: *See—*
Miller, John W. V.; and Trogdon, Ray L., 4,130,779, Cl. 315-169.0TV.

Ozudogru, Yilmaz H.: *See—*
Person, Abraham; and Ozudogru, Yilmaz H., 4,130,077, Cl. 114-230.000.

Packaging Corporation of America: *See—*
Champlin, Charles L.; and Misura, John T., 4,130,202, Cl. 206-434.000.

Pactrol Controls Limited: *See—*
Wade, Kenneth R., 4,130,753, Cl. 219-492.000.

Page Belting Company: *See—*
Alley, F. William, 4,130,141, Cl. 139-157.000.

Pagnini, Edillio. Tape dispenser. 4,130,229, Cl. 225-33.000.

Pai, Stephen M., to Westinghouse Electric Corp. Load management terminal having plural selectable address formats for a power line communication system. 4,130,874, Cl. 364-514.000.

Pains - Wessex Limited: *See—*
Murray, Dudley C., 4,130,060, Cl. 102-39.000.

Paleveda, William J.: *See—*
Holly, Frederick W.; Paleveda, William J.; Strachan, Robert G.; and Veber, Daniel F., 4,130,554, Cl. 260-112.50R.

Pallos, Ferenc M., to Stauffer Chemical Company. Acylformanidine insecticidal and miticidal compounds. 4,130,662, Cl. 424-324.000.

Palmer, Ian: *See—*
Braddyll, John R. G.; Aubrey, Joseph H.; Shaw, Ernest A.; and Palmer, Ian, 4,130,366, Cl. 366-288.000.

Panasenko, Anatoly A.: *See—*
Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Khlopkov, Leonid P.; Nesterovsky, Sergei G.; Starun, Andrei I.; Mironov, Viktor D.; Dibrov, Gennady D.; and Panasenko, Anatoly A., 4,130,439, Cl. 106-67.000.

Panayotov, Ivan M.: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, 4,130,703, Cl. 526-173.000.

Pandolph, James E. Ladder climber's safety device. 4,130,177, Cl. 182-8.000.

Pansini, Andrew L. Swimming pool cleaner. 4,129,904, Cl. 4-172.000.

Panzeri, Constantino: *See—*
De Marco, Franco; and Panzeri, Constantino, 4,130,736, Cl. 179-16.0EC.

Papst-Motoren KG: *See—*
Wrobel, Guenter, 4,130,770, Cl. 310-67.00R.

Parker, James A.: *See—*
Breznak, Robert A.; and Parker, James A., 4,130,679, Cl. 428-58.000.

Parker, Walter G.; Ravets, Jack M.; and Preble, Bruce S., to Westinghouse Electric Corp. Poison and diluent system for nuclear power plants. 4,130,459, Cl. 176-38.000.

Parks, Harold G.: *See—*
Kirkpatrick, Conilee G.; and Parks, Harold G., 4,130,891, Cl. 365-105.000.

Parodi, Arnold E. Spinning top and belt. 4,129,961, Cl. 46-64.000.

Parr, Edward L. Push-in pipe connector. 4,130,305, Cl. 285-308.000.

Partington, Albert J., to Westinghouse Electric Corp. Multiple side entry root for multiple blade group. 4,130,379, Cl. 416-193.00A.

Pascault, Jean-Pierre: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, 4,130,703, Cl. 526-173.000.

Paschke, Edward E.: *See—*
Cerefice, Steven A.; Fields, Ellis K.; Marchant, Kerford A., Jr.; and Paschke, Edward E., 4,130,719, Cl. 528-305.000.

Patel, Mukesh P.; and Yin, Huo-Bing, to International Business Machines Corporation. Bucket brigade circuit. 4,130,766, Cl. 307-221.00D.

Patel, Raman P.: *See—*
Coran, Aubert Y.; and Patel, Raman P., 4,130,534, Cl. 260-33.6AQ.
Coran, Aubert Y.; Das, Balbhadra; and Patel, Raman P., 4,130,535, Cl. 260-33.6AQ.

Patil, Pandit G., to PPG Industries, Inc. Solar collector for heating a fluid. 4,130,108, Cl. 126-270.000.

Patrawala, Ashok C.: *See—*
Bula, John; and Patrawala, Ashok C., 4,130,768, Cl. 307-270.000.

Patten, Michael A., to International Business Machines Corporation. Circuitry for compression of silence in dictation speech recording. 4,130,739, Cl. 179-100.1VC.

Patton, Robert J.: *See—*
Bouchard, Andre C.; Hall, Harold H., Jr.; Patton, Robert J.; and Sentementes, Thomas J., 4,130,082, Cl. 116-5.000.

Paul, Howard C., to Borg-Warner Corporation. Charge forming apparatus with vane actuated fuel air ratio control. 4,130,610, Cl. 261-36.00A.

Paul, Maynard C.; and Torok, Ernest J., to Sperry Rand Corporation. Isotropic data track for cross-tie wall memory system. 4,130,888, Cl. 365-87.000.

Paulie, Roy W. Combination safety belt and safety line. 4,130,176, Cl. 182-4.000.

Pawlak, Kenneth E., to Abbott Laboratories. Method of making self-supporting tubular filter. 4,130,622, Cl. 264-255.000.

Peeler, Donald H., to Sybron Corporation. Fluid pressure measuring or testing system and bleed regulator valve therefor. 4,130,114, Cl. 128-2.05G.

Peffer, Robert M.; Rehn, Albert H.; and Grose, Zacharie, to Eastman Kodak Company. Grounded grid static discharge apparatus. 4,130,852, Cl. 361-213.000.

Pelz, David T. Golf putting system for play and practice. 4,130,282, Cl. 273-186.00A.

Penet, Pierre M. M. Control assembly for a cyclically operating powered unit. 4,130,785, Cl. 318-318.000.

Penn Engineering & Manufacturing Corp.: *See—*
Swanstrom, Kenneth A., 4,130,138, Cl. 138-109.000.

Pennwalt Corporation: *See—*
Kamath, Vasanth R., 4,130,700, Cl. 526-73.000.

Peppler, Michael S.: *See—*
Asick, John C.; Huffnagle, Clifton W.; Peppler, Michael S.; and Woratyla, John A., 4,130,332, Cl. 339-97.00P.

Perez-Cavero, Leonardo, to General Electric Company Limited, The. Directional relays. 4,130,851, Cl. 361-82.000.

Perkin-Elmer Limited: *See—*
Ford, Michael A., 4,130,784, Cl. 318-102.000.

Perkins, Peter E.; and Blazo, Stephen F., to Tektronix, Inc. Charge image charge transfer cathode ray tube having a scan expansion electron lens system and collimation electrode means. 4,130,775, Cl. 313-397.000.

Perrin, Ronald, to St. Regis Paper Company, The. Film dispensing container. 4,130,228, Cl. 225-19.000.

Perry, Francis J.: *See—*
Chocholaty, Warren L.; Evans, Robert K.; and Perry, Francis J., 4,130,126, Cl. 137-3.000.

Perry, Francis V., Jr.; Barlik, Richard P.; Richardson, William P.; Hudson, Robert H.; and Gray, Leonard, to Hasbro Development Corp. Toy article having changeable expression graphics. 4,129,963, Cl. 46-155.000.

Person, Abraham; and Ozudogru, Yilmaz H., to Global Marine, Inc. Single-point mooring system. 4,130,077, Cl. 114-230.000.

Peters, Walter B.: *See—*
Cerny, Ronald N.; Peters, Walter B.; Sadler, Thomas H.; Rodrigo, Peter; and Mollick, George M., 4,130,140, Cl. 138-149.000.

Petersen, Arthur W.; Cimiluca, Arthur; and Hirschberger, Leonard, to Schwarzmann, Frederick G. Method for renewing grout. 4,130,442, Cl. 134-4.000.

Peterson, Clyde V., to Minnesota Mining and Manufacturing Company. Torsion spring door for a videocassette. 4,130,221, Cl. 220-326.000.

Peterson, Gregory P.: *See—*
Hamilton, Alan D.; Peterson, Gregory P.; and McGuire, Walter R., 4,130,451, Cl. 156-86.000.

Peterson, Kenneth S.: *See—*
Niemi, Ilmer I.; and Peterson, Kenneth S., 4,129,989, Cl. 405-70.000.

Peterson, Roland H.: *See—*
Hoy, Kenneth L.; and Peterson, Roland H., 4,130,523, Cl. 260-29.60R.

Petree, Harris E.; Myatt, Hal L.; and Jelenevsky, Alex M., to Ciba-Geigy Corporation. Preparation of phenolic ethylenediaminepolycarboxylic acids. 4,130,582, Cl. 562-448.000.

Petrosky, Charles. Air cushion shoe base. 4,129,951, Cl. 36-29.000.

Pfaffle, Ernst, to Hans Sickinger Co. Arrangement for perforating and spiral binding of relatively thick groups of sheets. 4,129,913, Cl. 11-1.00A.

Pfizer Inc.: *See—*
Sarges, Reinhard, 4,130,714, Cl. 548-309.000.
Taylor, Colin R., 4,130,647, Cl. 424-251.000.

Pham, Quang T.: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, 4,130,703, Cl. 526-173.000.

Phillips, David C.: *See—*
Smith, James D. B.; and Phillips, David C., 4,130,009, Cl. 73-17.00R.

Phillips Petroleum Company: *See—*
Fodor, Lawrence M., 4,130,503, Cl. 252-429.00B.
Gagle, Duane W.; and Draper, Homer L., 4,130,516, Cl. 260-28.5AS.
Marwil, Stanley J.; and Zuech, Ernest A., 4,130,484, Cl. 210-41.000.
Nasser, Benny E., Jr.; and Dietz, Richard E., 4,130,505, Cl. 252-432.000.

Phillips, Ronald W., II: *See—*
Edwards, David V.; Lesh, Harvey B., Jr.; and Phillips, Ronald W., II, 4,129,910, Cl. 9-42.000.

Pickard, Kenneth L. Side boom pipe laying crane with pipe section alignment feature. 4,130,204, Cl. 214-1.0PA.

Picker Corporation: *See—*
Goodrich, Albert S.; and Corcoran, Thomas M., 4,130,022, Cl. 73-633.000.
Mueller, Peter G.; and Goodrich, Albert S., 4,130,021, Cl. 73-633.000.

Pickus, Milton R.: *See—*
Wang, John L.; Pickus, Milton R.; and Chen, Meng-Hsiu, 4,130,422, Cl. 75-246.000.

Pieschke, Harald: *See—*
Knulle, Helmut; and Pieschke, Harald, 4,130,398, Cl. 29-157.400.

Pillot, Christian: *See—*
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, 4,130,703, Cl. 526-173.000.

Pittsburgh-Des Moines Steel Company: *See—*
Hills, Richard E.; Neely, Frank R.; Neely, Derek K.; and Malinowski, John T., 4,130,217, Cl. 220-226.000.

Pittsburgh Environmental and Energy Systems, Inc.: *See—*
Barnes, Hubert L.; and Shapiro, Edward, 4,130,628, Cl. 423-235.000.

Pizzolato, Giacomo: *See—*
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,130,568, Cl. 260-343.210.

Plambeck, Louis, Jr., to Du Pont de Nemours, E. I., and Company. Hydrophilic, oxygen permeable contact lens. 4,130,706, Cl. 526-245.000.

Pleskunas, Stanley A.: *See—*
McDonald, Michael D.; and Pleskunas, Stanley A., 4,129,911, Cl. 9-310.00E.

Plewes, John T.; and White, Philip R., to Bell Telephone Laboratories, Incorporated. Free machining Cu-Ni-Sn alloys. 4,130,421, Cl. 75-154.000.

Ploger, Walter; and Gutzschebauch, Claus, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Process of stabilization of anhydrous dibasic calcium phosphate against fluorine ions with cyclic aminophosphonic acids. 4,130,630, Cl. 423-265.000.

Plummer, Ernest L., to FMC Corporation. [1,1'-Biphenyl]-3-ylmethyl 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropanecarboxylates. 4,130,657, Cl. 424-305.000.

Plummer, William T.: *See—*
Erlichman, Irving; and Plummer, William T., 4,130,357, Cl. 354-241.000.

Plymak Company, Inc.: *See—*
McGee, David L., 4,130,041, Cl. 83-617.000.

Podobnik, Donald M.; and Harris, Guy H., to Dow Chemical Company, The. Froth flotation process. 4,130,477, Cl. 209-166.000.

Poe, L. Richard, to Hartwell Corporation. Adjustable keeper for pin latches. 4,130,260, Cl. 244-129.500.

Poe, L. Richard; and Harmon, Raymond E., to Hartwell Corporation. Pin latch and safety lock therefor. 4,130,307, Cl. 292-179.000.

Pohl, Ludwig: *See—*
Eidenschink, Rudolf; Krause, Joachim; and Pohl, Ludwig, 4,130,502, Cl. 252-299.000.

Poinas, Christian: *See—*
Boulanger, Claude; and Poinas, Christian, 4,130,743, Cl. 179-170.200.

Polaroid Corporation: *See—*
Dyer, Gerald T.; and Ryan, Michael A., 4,130,485, Cl. 210-66.000.
Erlichman, Irving; and Plummer, William T., 4,130,357, Cl. 354-241.000.

Politzer, Anton; and Machmer, Wilhelm. Sealing system for a wedge-type breech mechanism. 4,130,047, Cl. 89-26.000.

Polley, Eugene J., to Zenith Radio Corporation. Super imposed fresnel lenses for channel indicators. 4,130,346, Cl. 350-114.000.

Pollock, Jack H. Plug valve. 4,130,129, Cl. 137-385.000.

Pollutex Milieutechniek B.V.: *See—*
van Essen, Uilke, 4,130,486, Cl. 210-78.000.

Pomazan, Oleg K.: *See—*
Levin, Efim M.; Sysoev, Vladimir P.; Rudenko, Valery A.; and Pomazan, Oleg K., 4,130,381, Cl. 416-196.00R.

Poret, Jacques L.: *See—*
Oneto, Francis E. J.; Benzoni, Andre J. E.; Poret, Jacques L.; and Simon, Fernand B., 4,130,497, Cl. 252-89.00R.

Porter, James H., to Energy Resources Company, Inc. Fluidized-bed combustor. 4,130,071, Cl. 110-245.000.

PPG Industries, Inc.: *See—*
Friedlander, Charles B.; and McMullen, John C., 4,130,708, Cl. 528-28.000.
Littell, Harry E., Jr.; and Shorr, Norman, 4,130,684, Cl. 428-212.000.
Patil, Pandit G., 4,130,108, Cl. 126-270.000.

Prakash, Nellikunja J.: *See—*
Giroux, Eugene L.; Prakash, Nellikunja J.; and Schechter, Paul J., 4,130,653, Cl. 424-274.000.

Praschl, Wilhelm: *See—*
Theurer, Josef; and Praschl, Wilhelm, 4,130,063, Cl. 104-12.000.

Preble, Bruce S.: *See—*
Parker, Walter G.; Ravets, Jack M.; and Preble, Bruce S., 4,130,459, Cl. 176-38.000.

Precision Paper Tube Compay: *See—*
Thomas, Anthony V., 4,130,036, Cl. 82-90.000.

Pressmaster AB: *See—*
Wiener, Hans; and Undin, Hans, 4,130,031, Cl. 81-9.50R.

Prikhozhan, Ada M.: *See—*
Nudelman, Boris I.; Sventsitsky, Alexandr S.; Bikbau, Marsel Y.; Prikhozhan, Ada M.; and Ibragimov, Isak M., 4,130,441, Cl. 106-89.000.

Pritchett, Robert L.: *See—*
D'Altroy, Frederick A.; Hartman, Adrian R.; Jacobs, Richard M.; Pritchett, Robert L.; and Shackle, Peter W., 4,130,827, Cl. 357-38.000.

Process Scientific Innovations Ltd.: *See—*
Hunter, George S.; Hunter, Susanne P.; and Walker, Brian, 4,130,487, Cl. 210-85.000.

Procter & Gamble Company, The: *See—*
Diehl, Francis L.; and Edwards, James B., 4,130,392, Cl. 8-101.000.
Gregg, Richard, 4,130,669, Cl. 426-385.000.
Smith, Donald E., 4,130,643, Cl. 424-238.000.
Smith, Donald E., 4,130,667, Cl. 424-361.000.
Wetzel, Thomas A., 4,130,121, Cl. 132-7.000.

Proietti, Giovanni: *See—*
Careglio, Giuseppe; and Proietti, Giovanni, 4,130,860, Cl. 362-217.000.

Prosvirova, Olga B., administrator: *See—*
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.

Prygoff, Jack. Audio message broadcast system. 4,130,801, Cl. 325-4.000.

Pullman Incorporated: *See—*
Stark, Marvin; and Suvada, Steve L., 4,130,068, Cl. 105-420.000.

Pummer, Helmut: *See—*
Grassi, Guido; Baumann, Hans-Peter; and Pummer, Helmut, 4,130,589, Cl. 260-584.00B.

Purcell, Frederick C., to Ashland Oil, Inc. High solids, low viscosity thermosetting phenolic/epoxy coating system. 4,130,531, Cl. 260-31.4EP.

Purolator Filter G.m.b.H.: *See—*
Hetzer, Fritz, 4,130,745, Cl. 200-82.00E.

Purviance, John R. Self-propelled airplane dolly. 4,130,210, Cl. 214-332.000.

Questor Corporation: *See—*
Nisper, Kenneth J., 4,130,288, Cl. 277-216.000.

Quigley, Richard J.: *See—*
Reynolds, Clarke; and Quigley, Richard J., 4,129,965, Cl. 49-220.000.

Raadsen, Jacob: *See—*
Van Ballegooijen, Hendrik; Binsbergen, Frederik L.; Raadsen, Jacob; and Vreugdenhil, Arie D., 4,130,606, Cl. 260-894.000.

Rabl, Arnulf; and Winston, Roland, to United States of America, Energy. Solar concentrator with restricted exit angles. 4,130,107, Cl. 126-270.000.

Radley, Peter E.: *See—*
Hall, Ralph A.; and Radley, Peter E., 4,130,807, Cl. 330-124.00R.

Rajput, Yudh V.; and Couchot, Carl A., to B. F. Goodrich Company, The. Tandem control brake system. 4,130,323, Cl. 303-106.000.

Ransburg Corporation: *See—*
Smart, William L.; Hoenig, Stuart A.; Savitz, Christian W.; and Darlington, Douglas K., 4,129,966, Cl. 51-170.00T.

Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, to Agence Nationale de Valorisation de la Recherche (ANVAR). Heterogeneous anionic polymerization process. 4,130,703, Cl. 526-173.000.

Rasmusson, Bo M.: *See—*
Carlsson, Stig T.; Rasmusson, Bo M.; and Scuka, Viktor, 4,129,992, Cl. 405-164.000.

Rationator-Maschinenbau GmbH: *See—*
Schindel, Hugo; and Mecks, Karl, 4,130,194, Cl. 198-397.000.

Raufoss Ammunisjonsfabrikker A/S: *See—*
Hartvig, Tor, 4,130,418, Cl. 75-126.00B.

Ravets, Jack M.: *See—*
Parker, Walter G.; Ravets, Jack M.; and Preble, Bruce S., 4,130,459, Cl. 176-38.000.

Raytheon Company: *See—*
Sandy, Frank; and Dunnrowicz, Clarence J., 4,130,813, Cl. 333-72.000.
Wallace, Ronald M., 4,130,810, Cl. 331-107.00R.

RCA Corporation: *See—*
Clay, Burton R.; and Gore, Douglas A., 4,130,338, Cl. 350-3.820.
den Hollander, Willem, 4,130,783, Cl. 315-371.000.
Knop, Karl, 4,130,347, Cl. 350-162.00R.
Nossen, Edward J.; and Volertas, Vytas F., 4,130,802, Cl. 325-30.000.
Smollin, Charles F., 4,130,886, Cl. 364-900.000.

Reale, Michael J.; and Jacobs, Barry, to Stauffer Chemical Company. Flame retarded polyurethane foams with improved color qualities. 4,130,513, Cl. 521-107.000.

Reed, Charles F., to Avery International Corporation. Adjustable anvil roll for die-cutting labels. 4,130,042, Cl. 83-887.000.

Regie Nationale des Usines Renault: *See—*
Hemmen, Marcel; and Heron, Jacky, 4,130,318, Cl. 297-410.000.
Rehn, Albert H.: *See—*
Peffer, Robert M.; Rehn, Albert H.; and Grose, Zacharie, 4,130,852, Cl. 361-213.000.
Reighter, David H., to Gould Inc. High humidity resistant electrical grade polymer concrete. 4,130,536, Cl. 260-37.0EP.
Reins, Edward R.; and Curry, Charles D. B., to United States of America, Navy. Digital plotting system for displaying character information. 4,130,887, Cl. 364-900.000.
Renner, Alfred: *See—*
Haug, Theobald; Kiefer, Jurg; and Renner, Alfred, 4,130,564, Cl. 260-326.260.
Republic Steel Corporation: *See—*
Reusser, Hans E., 4,129,971, Cl. 52-288.000.
Resh, John S., to McGill Manufacturing Company, Inc. Miniature overtravel snap action switch with pivotal cam mounting for the switch blade. 4,130,747, Cl. 200-67.00D.
Reusser, Hans E., to Republic Steel Corporation. Edge cover trim. 4,129,971, Cl. 52-288.000.
Reynolds, Clarke; and Quigley, Richard J. Safety crank assembly for railroad box car plug-type doors. 4,129,965, Cl. 49-220.000.
Reynolds Metals Company: *See—*
Cudzik, Daniel F., 4,130,074, Cl. 113-121.00R.
Rhone Poulenc Industries: *See—*
Canard, Pierre; and Levy, Albert, 4,130,691, Cl. 428-511.000.
Rhorer, William F.; and Zito, Joseph V. Auxiliary steering control for electric trolling motor. 4,130,079, Cl. 115-18.00E.
Riboud, Paul-Victor: *See—*
Chastant, Marc; and Riboud, Paul-Victor, 4,130,423, Cl. 75-257.000.
Ricci Bitti, Roberto: *See—*
Marianeschi, Edmondo; Basevi, Sandro; Barisoni, Mario; Marini, Paolo; Borgianni, Carlo; and Ricci Bitti, Roberto, 4,130,447, Cl. 148-27.000.
Rice, Donald R. Spare wheel and tire locking mount for pickup trucks. 4,130,227, Cl. 224-42.240.
Richards Manufacturing Co., Inc.: *See—*
Graham, Charles M., 4,130,113, Cl. 128-20.000.
Richardson-Merrell Inc.: *See—*
Dhabhar, Dadi J.; Heyd, Allen; and Gans, Eugene H., 4,130,638, Cl. 424-55.000.
Richardson, William P.: *See—*
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Richenburg, Paul F.: *See—*
Fiegehen, Allan G.; Houghton, Robert P.; Bradley, Cecil Earl; and Richenburg, Paul F., 4,130,788, Cl. 318-574.000.
Richiardi, Claudio: *See—*
Fioretta, Piero; and Richiardi, Claudio, 4,130,873, Cl. 364-513.000.
Richtzenhain, Herman: *See—*
Vogt, Wilhelm; and Richtzenhain, Herman, 4,130,592, Cl. 568-604.000.
Rideal, Graham R.: *See—*
Ballard, Denis G. H.; Cundy, Colin S.; and Rideal, Graham R., 4,130,687, Cl. 428-310.000.
Riedesel, Roland G., Jr.: *See—*
Bridges, James R.; Riedesel, Roland G., Jr.; and Thompson, Larry W., 4,130,793, Cl. 324-6.000.
Rieger, Franz: *See—*
Linder, Ernst; Wossner, Gunter; Maurer, Helmut; and Rieger, Franz, 4,130,098, Cl. 123-119.00A.
Riehl, Angela. Bed storage article. 4,129,909, Cl. 5-317.00R.
Riekers, Henry G., to Westinghouse Electric Corp. Binary multiplier using identical memories or identical networks. 4,130,877, Cl. 364-758.000.
Righelato, Renton C.; and Deavin, Lynda, to Tate & Lyle Limited. Continuous process for the production of polysaccharide under phosphate limiting conditions. 4,130,461, Cl. 195-31.00P.
Riker Laboratories, Inc.: *See—*
Moore, George G. I., 4,130,666, Cl. 424-331.000.
Rineisky, Anatoly A.: *See—*
Iljunin, Vladimir G.; Murogov, Viktor M.; Troyanov, Mikhail F.; Rineisky, Anatoly A.; Ustinov, Gennady G.; and Shmelev, Anatoly N., 4,130,460, Cl. 176-68.000.
Ristic, Cedomir B. Ventilating system. 4,130,111, Cl. 126-299.00D.
Ritzie, Robert H., to Dow Chemical Company, The. Mechanical seal assembly with flushing means. 4,130,287, Cl. 277-12.000.
Robdell, Clyde A.: *See—*
Mitchell, Wylie W.; and Arrowood, Gordon W., 4,130,302, Cl. 285-113.000.
Robert Bosch GmbH: *See—*
Bertling, Johannes-Gerhard, 4,130,266, Cl. 251-50.000.
Dietz, Hermann; and Ziegler, Siegfried, 4,130,695, Cl. 429-215.000.
Falk, Gerhard, 4,130,257, Cl. 242-193.000.
Jundt, Werner; Bodig, Bernd; Sohner, Gerhard; Ruf, Walter; Roth, Helmut; and Werner, Peter, 4,130,101, Cl. 123-148.00E.
Linder, Ernst; Wossner, Gunter; Maurer, Helmut; and Rieger, Franz, 4,130,098, Cl. 123-119.00A.
Roberts, Wilbert J.; and Weissman, Gerald R., to Detrex Chemical Industries, Inc. Process of controlling organic coatings in aqueous spray booth systems. 4,130,674, Cl. 427-331.000.
Robinson, Thomas L., Sr., to T. L. Robinson Co., Inc. EL bar graph for displaying analogue measurements of temperature and the like. 4,130,776, Cl. 313-507.000.
Robinson, Walter L. Aquatic device. 4,129,912, Cl. 9-310.00D.
Robitaille, George L. Combustion engine exhaust gas afterburner. 4,130,397, Cl. 422-168.000.
Rockwell International Corporation: *See—*
Gunckel, Thomas L., II; Rovell, Alex; and Nielsen, Robert L., 4,130,892, Cl. 365-154.000.
Rodbell, Arthur T.: *See—*
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Rodbell, Leonard B.: *See—*
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Rodbell, Paul N.: *See—*
Mitchell, Wylie W.; and Arrowood, Gordon W., 4,130,302, Cl. 285-113.000.
Rodbell, Sidney P.: *See—*
Mitchell, Wylie W.; and Arrowood, Gordon W., 4,130,302, Cl. 285-113.000.
Rodrigo, Peter: *See—*
Cerny, Ronald N.; Peters, Walter B.; Sadler, Thomas H.; Rodrigo, Peter; and Mollick, George M., 4,130,140, Cl. 138-149.000.
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Sessions, Robert W.; Jeslis, Jerome; and Rodzen, Richard A., 4,130,119, Cl. 128-325.000.
Roericht, Hans, to Wilkhahn, Wilkening & Hahne. Chairs. 4,130,263, Cl. 248-371.000.
Rogatkin, Alexandr A.: *See—*
Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Khlopkov, Leonid P.; Nesterovsky, Sergei G.; Starun, Andrei I.; Mironov, Viktor D.; Dibrov, Gennady D.; and Panasenko, Anatoly A., 4,130,439, Cl. 106-67.000.
Rohm, Gunter H. Radial-jaw chuck for lathes and like turning machines. 4,130,290, Cl. 279-121.000.
Rohm and Haas Company: *See—*
Cholod, Michael, 4,130,580, Cl. 260-465.600.
Roland Offsetmaschinenfabrik Faber & Schleicher AG.: *See—*
List, Klaus; and Abendroth, Paul, 4,130,057, Cl. 101-148.000.
Rolls-Royce Limited: *See—*
Nelson, Michael E., 4,129,984, Cl. 60-39.09D.
Romero, Earl M.: *See—*
Slough, Carlton M.; and Romero, Earl M., 4,130,791, Cl. 324-3.000.
Roos, Otto; and Essig, Dieter, to Boehringer Ingelheim GmbH. Process for preparation of alkali metal salts of ampicillin. 4,130,558, Cl. 260-239.100.
Roper, Robert; Newman, Neil F.; and Hous, Pierre, to Exxon Research & Engineering Co. Stabilized halogenated butyl rubber. 4,130,519, Cl. 260-23.70H.
Rosen, George, to Sun Chemical Corporation. Process for the preparation of aryl dioxolanes. 4,130,567, Cl. 260-340.90R.
Rosengren, Ake; Bjellqvist, Bengt; and Gasparic, Vesna, to Aminkemi AB. Method for generating a pH-function for use in electrophoresis. 4,130,470, Cl. 204-180.00G.
Ross, Lawrence J., to American Cyanamid Company. Preparing J acid by fusion using phenolic fluxing agent. 4,130,581, Cl. 260-509.000.
Ross, Richard J.: *See—*
Akkerman, Neil H.; and Ross, Richard J., 4,130,166, Cl. 166-324.000.
Ross, Samuel C. Indoor golf. 4,130,279, Cl. 273-87.200.
Rossi, Joseph V., to Comfort Lines, Inc. Step ladder/chair combination. 4,130,316, Cl. 297-46.000.
Roth, Helmut: *See—*
Jundt, Werner; Bodig, Bernd; Sohner, Gerhard; Ruf, Walter; Roth, Helmut; and Werner, Peter, 4,130,101, Cl. 123-148.00E.
Rothbart, Herbert L.: *See—*
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 4,130,572, Cl. 260-410.700.
Roussel Uclaf: *See—*
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,130,658, Cl. 424-308.000.
Rovell, Alex: *See—*
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Roy L. Wines & Son, Inc.: *See—*
Wines, Roy L., Jr.; and Wines, Roy L., III, 4,130,123, Cl. 134-56.00R.
Royer, Fernand. Modular construction element. 4,129,968, Cl. 52-79.100.
Rozga, Vincent E., to Kelley Company Inc. Skew control mechanism for sheet material. 4,130,275, Cl. 271-251.000.
Rubenstein, Kenneth E.; and Leute, Richard K., to Syva Company. Receptor steric hindrance immunoassay for receptor determination. 4,130,462, Cl. 195-103.50A.
Ruckdeschel, Frederick R.: *See—*
Walsh, Arthur M.; and Ruckdeschel, Frederick R., 4,130,841, Cl. 358-298.000.
Rudenko, Valery A.: *See—*
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Rusch, Reinhart: *See—*
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Russ, James J.; Russ, James S.; and Heagy, Richard T. Process for recovering mineral values from fly ash. 4,130,627, Cl. 423-127.000.

Russ, James S.: *See*—
Russ, James J.; Russ, James S.; and Heagy, Richard T., 4,130,627, Cl. 423-127.000.
Russell, Thomas H., III. Record tray with adjustable side rails. 4,130,203, Cl. 211-51.000.
Ruti Machinery Works Ltd: *See*—
Smutny, Viktor, 4,130,143, Cl. 139-449.000.
Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of phenols and naphthols. 4,130,504, Cl. 252-430.000.
Ryan, Michael A.: *See*—
Dyer, Gerald T.; and Ryan, Michael A., 4,130,485, Cl. 210-66.000.
Rybny, Charles B.; and Levine, Eli, to Celanese Corporation. Preparation of acrylated or methacrylated polymers utilizing a partially solubilized hydrocarbon fraction as the azeotroping medium. 4,130,518, Cl. 260-22.0CB.
S I G Schweizerische Industrie-Gesellschaft: *See*—
Loewenthal, Horst, 4,130,480, Cl. 209-551.000.
Sabacky, Milton J., to Monsanto Company. Herbicidal use of substituted phenyl phosphinic acids. 4,130,410, Cl. 71-86.000.
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Cerny, Ronald N.; Peters, Walter B.; Sadler, Thomas H.; Rodrigo, Peter; and Mollick, George M., 4,130,140, Cl. 138-149.000.
Saethre, Magnus; and Spector, George. Shopping cart capable for use on stairs. 4,130,291, Cl. 280-5.220.
Saidla, Glen E. W., to Exxon Research & Engineering Co. Method for making structural foams with facing sheets. 4,130,614, Cl. 264-46.400.
Saigusa, Tatsunori: *See*—
Kojima, Kenji; and Saigusa, Tatsunori, 4,130,268, Cl. 251-298.000.
Saika, Tadaaki: *See*—
Kobayashi, Toshihiro; and Saika, Tadaaki, 4,130,390, Cl. 432-14.000.
St. John, Robert P., to Xerox Corporation. Speed control apparatus for scanning system. 4,130,838, Cl. 358-267.000.
St. Regis Paper Company, The: *See*—
Perrin, Ronald, 4,130,228, Cl. 225-19.000.
Sakai, Masahiko: *See*—
Goto, Kazuo; Toyoda, Shinichi; and Sakai, Masahiko, 4,130,546, Cl. 528-73.000.
Sakakibara, Naoji; and Hashimoto, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Electrically operated switching valve. 4,130,265, Cl. 251-11.000.
Salle, Robert: *See*—
Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan M.; Pascault, Jean-Pierre; Pham, Quang T.; Pillot, Christian; and Salle, Robert, 4,130,703, Cl. 526-173.000.
Salvia, Matthew. Shipping cage for feeding animals water from disposable bags. 4,130,088, Cl. 119-19.000.
Sanada, Seiji: *See*—
Isono, Katsuo; and Sanada, Seiji, 4,130,831, Cl. 358-27.000.
Sanders, James M.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.
Sandoz Ltd.: *See*—
Grassi, Guido; Baumann, Hans-Peter; and Pummer, Helmut, 4,130,589, Cl. 260-584.00B.
Sandstedt, Gary O. Bidirectional data transfer and storage system. 4,130,738, Cl. 179-90.00B.
Sandvik Aktiebolag: *See*—
Andersson, Einar W., 4,130,270, Cl. 254-104.000.
Druxeis, Rudolf, 4,130,371, Cl. 407-114.000.
Sandy, Frank; and Dunnrowicz, Clarence J., to Raytheon Company. Surface wave device having enhanced reflectivity gratings. 4,130,813, Cl. 333-72.000.
Santer, J. Owen: *See*—
Anderson, George J.; Desmond, Timothy F.; and Santer, J. Owen, 4,130,692, Cl. 428-524.000.
Sarges, Reinhard, to Pfizer Inc. Hydantoin therapeutic agents. 4,130,714, Cl. 548-309.000.
Sasaki, Shiro; Yasumatsu, Jun; and Tatematsu, Kazuhisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Passenger restraining belt retractor. 4,130,255, Cl. 242-107.100.
Sato, Yuichi: *See*—
Kanno, Kenichi; Suzuki, Masayuki; and Sato, Yuichi, 4,130,464, Cl. 204-1.00T.
Satoh, Tsuyoshi; and Tachino, Kenzo, to Mitsubishi Denki Kabushiki Kaisha. Elevator speed control system. 4,130,184, Cl. 187-29.00R.
Sauer, Donald G., to National Can Corporation. Apparatus for thermoforming plastic articles. 4,130,387, Cl. 425-388.000.
Savage, John A.: *See*—
Dunster, Ronald A.; and Savage, John A., 4,130,146, Cl. 141-96.000.
Savitz, Christian W.: *See*—
Smart, William L.; Hoenig, Stuart A.; Savitz, Christian W.; and Darlington, Douglas K., 4,129,966, Cl. 51-170.00T.
Sawyer, John: *See*—
Bolen, Ralph A., 4,130,152, Cl. 145-50.00D.
Scaccia, Ralph J.: *See*—
Millham, Ernest H.; Scaccia, Ralph J.; and Villante, Francis J., 4,130,240, Cl. 235-303.100.
Scardenzan, Anthony. Wheel for roller skate or skateboard. 4,130,320, Cl. 301-5.700.
Schaden, Karl. Method of producing a concrete lined tunnel or other underground excavation. 4,129,991, Cl. 405-150.000.
Schafer, Wilhelm: *See*—
Henkelmann, Kurt; Speier, Rolf; and Schafer, Wilhelm, 4,130,353, Cl. 353-85.000.
Schechter, Paul J.: *See*—
Giroux, Eugene L.; Prakash, Nellikunja J.; and Schechter, Paul J., 4,130,653, Cl. 424-274.000.
Scheidler, Herwig: *See*—
Kristen, Klaus; and Scheidler, Herwig, 4,130,104, Cl. 126-39.00J.
Schenck-Auto-Service Geraete GmbH: *See*—
Maus, Otfrid, 4,130,020, Cl. 73-457.000.
Schepers, Bernhard; Hellinghausen, Heinz; and Kramer, Alois, to Guilini Chemie G.m.b.H. Method for producing coarsely crystalline alumina. 4,130,402, Cl. 51-309.00A.
Schering AG: *See*—
Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,130,414, Cl. 71-90.000.
Schiele, Herbert, to Krauss-Maffei Aktiengesellschaft. Replaceable liner for centrifuge sieve. 4,130,479, Cl. 209-395.000.
Schindel, Hugo; and Mecks, Karl, to Rationator-Maschinenbau GmbH. Apparatus for erecting and aligning articles. 4,130,194, Cl. 198-397.000.
Schlesinger, Todd R.; and Shaffer, William L. Adjustable skateboard ramp. 4,129,916, Cl. 14-69.500.
Schloss, Phillip C.: *See*—
Heuer, Dale A.; McCallister, Charles W.; and Schloss, Phillip C., 4,130,868, Cl. 364-200.000.
Schlotterer, John C., to Westinghouse Electric Corp. Priority selection circuit for multiported central functional unit with automatic priority reduction on excessive port request. 4,130,864, Cl. 364-200.000.
Schmidt, Horst: *See*—
Mender, Adolf; and Schmidt, Horst, 4,130,834, Cl. 358-127.000.
Schmidt, Werner, to Maschinenfabrik Rissen GmbH. Combined throw-away container of cardboard and plastic material with a rigidly flanged aperture rim or lip. 4,130,234, Cl. 229-1.50B.
Schmidt'sche Heissdampf-GmbH: *See*—
Knulle, Helmut; and Pieschke, Harald, 4,130,398, Cl. 29-157.400.
Schmitt, Kirk D.: *See*—
Bridger, Robert F.; and Schmitt, Kirk D., 4,130,496, Cl. 252-49.800.
Schneider, Peter, to Siemens Aktiengesellschaft. Hierarchially arranged memory system for a data processing arrangement having virtual addressing. 4,130,870, Cl. 364-200.000.
Schochat, Nathaniel E. CB twenty meter. 4,130,755, Cl. 235-95.00R.
Scholl, Malcolm M.: *See*—
Ostrander, Walter M.; Scholl, Malcolm M.; Minott, Edward R.; and Smith, Christopher D., 4,130,174, Cl. 181-146.000.
Scholz, Karl-Heinz; Hartmann, Willy; and Heine, Hans-Georg, to Bayer Aktiengesellschaft. Δ4-Oxazolin-2-ones and process therefor. 4,130,563, Cl. 260-307.00C.
Schommer, John. Article for injecting air into live bait. 4,129,955, Cl. 43-4.000.
Schotten, Henno, to Bosch-Siemens Hausgerate GmbH. Refrigeration equipment, particularly household refrigeration or the like. 4,129,993, Cl. 62-156.000.
Schreiber, William L.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.
Schretter, James A.: *See*—
Stewart, Robert D.; and Schretter, James A., 4,130,130, Cl. 137-475.000.
Schreyer, Kenneth D., to Columbus McKinnon Corporation. Telescopic turnbuckle. 4,130,269, Cl. 254-67.000.
Schroer, Peter, to Geyer & Co. Expandable core for injection molding. 4,130,264, Cl. 249-180.000.
Schuetz, Willy: *See*—
Cronin, John C.; and Schuetz, Willy, 4,130,850, Cl. 361-54.000.
Schuler, Ulrich: *See*—
Susdorf, Roman; Schuler, Ulrich; and Engelmann, Heinz, 4,130,065, Cl. 105-135.000.
Schulte, Klaus: *See*—
Boggum, Paul; and Schulte, Klaus, 4,130,391, Cl. 432-264.000.
Schultenkamper, Josef, to Gelenkwellenbau GmbH. Thrust plate for the bearing pins of a trunnion in a universal joint. 4,130,325, Cl. 308-163.000.
Schwab, Randall J., to Transco Northwest, Inc. Package elevator for a ship. 4,130,196, Cl. 198-796.000.
Schwarz, Gerhard: *See*—
Lang, Rudolf; and Schwarz, Gerhard, 4,130,358, Cl. 354-289.000.
Schwarzmann, Frederick G.: *See*—
Petersen, Arthur W.; Cimiluca, Arthur; and Hirschberger, Leonard, 4,130,442, Cl. 134-4.000.
Schweitzer, Paul H.; and Collins, Thomas W., to Optimizer Control Corp. Optimizing control system. 4,130,863, Cl. 364-105.000.
Schwer, Lukas, to Theben-Werk Zeitautomatik GmbH & Co. KG. Plug-type switch. 4,130,748, Cl. 200-38.00D.
Scitronix Corporation: *See*—
Gagnon, Richard T., 4,130,729, Cl. 179-1.0SA.
SCM Corporation: *See*—
McGinniss, Vincent D., 4,130,469, Cl. 204-159.160.
McGinniss, Vincent D., 4,130,522, Cl. 260-29.2TN.
Scott, Ronald K.: *See*—
Bailey, John M.; and Scott, Ronald K., 4,130,013, Cl. 73-119.00A.

Scuka, Viktor: *See—*
Carlsson, Stig T.; Rasmusson, Bo M.; and Scuka, Viktor, 4,129,992, Cl. 405-164.000.
Sealectro Corporation: *See—*
Wessel, Kenneth, 4,130,328, Cl. 339-18.00C.
Sealy, Inc.: *See—*
Wagner, Robert F., 4,129,908, Cl. 5-35.000.
Searle Medidata, Inc.: *See—*
Haessler, Herbert A.; Elshtain, Errol L.; and Holland, Taffy, 4,130,881, Cl. 364-900.000.
Seifried, Hildegarde: *See—*
Engelmann, Rudolph H., 4,130,819, Cl. 340-146.3AC.
Seipos, Andrew G.: *See—*
Jureit, J. Calvin; Seipos, Andrew G.; and Langevin, William J., 4,129,933, Cl. 29-417.000.
Seitz, Alan F., to Data Motion Incorporated. Sheet feed tractor. 4,130,230, Cl. 226-75.000.
Sendlak, Lawrence P., to Hooker Chemicals & Plastics Corp. Liquid phase fluorination process. 4,130,594, Cl. 260-651.00F.
Senninger Irrigation, Inc.: *See—*
Healy, Mark, 4,130,247, Cl. 239-523.000.
Senoo, Tadao: *See—*
Takahashi, Mitsuhiro; Senoo, Tadao; Minekawa, Shigeo; and Hirai, Toshiharu, 4,130,686, Cl. 428-294.000.
Sentementes, Thomas J.: *See—*
Bouchard, Andre C.; Hall, Harold H., Jr.; Patton, Robert J.; and Sentementes, Thomas J., 4,130,082, Cl. 116-5.000.
Serada, Manabu: *See—*
Itoh, Iko; Takahashi, Tsukasa; Takamuku, Shinkichi; Aramaki, Azuma; and Serada, Manabu, 4,130,456, Cl. 159-165.000.
Serres, Carl: *See—*
Bockrath, Ronald E.; and Serres, Carl, 4,130,551, Cl. 528-481.000.
Sessions, Robert W.; Jeslis, Jerome; and Rodzen, Richard A., to Barlow Mfg. Corp. Occlusion device. 4,130,119, Cl. 128-325.000.
Sevcik, Stanislav; Trekoval, Jiri; Holata, Jan; and Stamberg, Jiri, to Ceskoslovenska akademie ved. Polymers of pivaloyloxyalkyl methacrylates, method for their preparation and modification. 4,130,705, Cl. 526-230.000.
Seward, Thomas P., III: *See—*
Mazeau, Jean P.; and Seward, Thomas P., III, 4,130,437, Cl. 106-54.000.
Shackle, Peter W.: *See—*
D'Altroy, Frederick A.; Hartman, Adrian R.; Jacobs, Richard M.; Pritchett, Robert L.; and Shackle, Peter W., 4,130,827, Cl. 357-38.000.
Shaffer, William L.: *See—*
Schlesinger, Todd R.; and Shaffer, William L., 4,129,916, Cl. 14-69.500.
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Absorbable pharmaceutical compositions based on isomorphic copolyoxalates. 4,130,639, Cl. 424-78.000.
Shanks, Robin G.: *See—*
Muller, Erich; Diederen, Willi; and Shanks, Robin G., 4,130,650, Cl. 424-263.000.
Shapiro, Edward: *See—*
Barnes, Hubert L.; and Shapiro, Edward, 4,130,628, Cl. 423-235.000.
Shaub, Harold; and Metro, Stephen J., to Exxon Research & Engineering Co. Synthetic lubricant composition. 4,130,494, Cl. 252-32.500.
Shaunnessey, Jerome. Occupant restraint and protection system for an automotive vehicle. 4,130,298, Cl. 280-730.000.
Shaw, Ernest A.: *See—*
Braddyll, John R. G.; Aubrey, Joseph H.; Shaw, Ernest A.; and Palmer, Ian, 4,130,366, Cl. 366-288.000.
Shawl, Edward T.; Sheng, Ming N.; and Zajacek, John G., to Atlantic Richfield Company. Removal of selenium from urethane solutions. 4,130,633, Cl. 423-509.000.
Sheikh, Junaid: *See—*
Gallo, Luigi C.; and Sheikh, Junaid, 4,130,842, Cl. 360-35.000.
Shell Oil Company: *See—*
Denison, Early B., 4,130,169, Cl. 175-299.000.
Van Ballegooijen, Hendrik; Binsbergen, Frederik L.; Raadsen, Jacob; and Vreugdenhil, Arie D., 4,130,606, Cl. 260-894.000.
Vogel, Charles B.; and Worrell, Gene T., 4,130,816, Cl. 340-15.5BH.
Shelton, George W. Ring guard attachable by melting end portions thereof. 4,129,999, Cl. 63-15.600.
Sheng, Ming N.: *See—*
Shawl, Edward T.; Sheng, Ming N.; and Zajacek, John G., 4,130,633, Cl. 423-509.000.
Shephard, Margaret C.; and Worthington, Paul A., to Imperial Chemical Industries Limited. Triazolyl butandiones. 4,130,409, Cl. 71-76.000.
Shepherd Products U.S. Inc.: *See—*
Greene, Frederick C., 4,129,921, Cl. 16-38.000.
Sher, Lawrence D., to Bolt Beranek and Newman Inc. Three-dimensional display. 4,130,832, Cl. 358-89.000.
Sheridan, Joseph U. Composite abrasion resistant pipe elbow. 4,130,300, Cl. 285-16.000.
Sherman, Morton; and Berry, James A., to Celotex Corporation, The. Top vented insulating structure. 4,129,972, Cl. 52-303.000.
Sherwin, Raymond H. Paint roller cleaner. 4,130,124, Cl. 134-138.000.
Shidler, Karl A.: *See—*
Knutson, Gerald R.; and Shidler, Karl A., 4,129,937, Cl. 29-603.000.
Shields, William D. Motorcycle fairing with vent means. 4,130,315, Cl. 296-78.100.
Shier, George D., to Dow Chemical Company, The. Process for production of piperazinediones. 4,130,711, Cl. 544-385.000.
Shimizu, Akihiko; and Kita, Atsushi, to Toyo Soda Manufacturing Co., Ltd. Process for producing sulfur modified polychloroprene in the presence of quaternary ammonium salts. 4,130,704, Cl. 526-217.000.
Shimoda, Yoshio: *See—*
Otsuka, Shigeru; Mori, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; Shimoda, Yoshio; Takeuchi, Takashi; Oku, Masakazu; and Mori, Kan, 4,130,668, Cl. 426-287.000.
Shinko-Pfaudler Company, Ltd.: *See—*
Hourai, Akimasa, 4,130,613, Cl. 261-109.000.
Shionogi & Co., Ltd.: *See—*
Hamashima, Yoshio; Tsuji, Teruji; Yoshioka, Mitsuru; Narisada, Masayuki; Komeno, Taichiro; Tanida, Hiroshi; and Nagata, Wataru, 4,130,557, Cl. 260-239.00A.
Terasawa, Tadao; and Okada, Toshihiko, 4,130,565, Cl. 260-327.0TH.
Shionoya, Hiroshi: *See—*
Kijima, Shizumasa; Shionoya, Hiroshi; Hamamura, Kimio; Arai, Haruyoshi; and Koyanagi, Nozomu, 4,130,648, Cl. 424-251.000.
Shiota, Hirotaka: *See—*
Kobashi, Toshiyuki; Shiota, Hirotaka; and Umetani, Haruki, 4,130,525, Cl. 260-29.6AN.
Shmelev, Anatoly N.: *See—*
Iljunin, Vladimir G.; Murogov, Viktor M.; Troyanov, Mikhail F.; Rineisky, Anatoly A.; Ustinov, Gennady G.; and Shmelev, Anatoly N., 4,130,460, Cl. 176-68.000.
Shoilco, Inc.: *See—*
Anthony, Myron L., 4,130,474, Cl. 208-11.0LE.
Shoji, Akio: *See—*
Ohoka, Masataka; Yamada, Mitsuko; Shoji, Akio; and Arimoto, Shunji, 4,130,601, Cl. 260-835.000.
Shono, Hiroaki: *See—*
Wakasa, Isao; Kawaguchi, Yutaka; and Shono, Hiroaki, 4,130,406, Cl. 65-2.000.
Shorr, Norman: *See—*
Littell, Harry E., Jr.; and Shorr, Norman, 4,130,684, Cl. 428-212.000.
Showa Denko K.K.: *See—*
Nagato, Nobuyuki; and Naito, Taketoshi, 4,130,577, Cl. 260-453.00P.
Shum, Lanson Y., to Westinghouse Electric Corp. Calibrating and measuring circuit for a capacitive probe-type instrument. 4,130,796, Cl. 324-61.00R.
Shuster, Edward J.: *See—*
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,130,508, Cl. 252-522.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.
Shutt, Thomas C., to Vitrofil Corporation. Preparation of smoke and flame retardant resinous compositions. 4,130,538, Cl. 260-40.00R.
Siegel, Stanley: *See—*
Melendres, Carlos A.; and Siegel, Stanley, 4,130,500, Cl. 252-182.100.
Siemens Aktiengesellschaft: *See—*
Branston, David W., 4,130,778, Cl. 315-169.0TV.
Hildinger, Eugen, 4,130,884, Cl. 364-900.000.
Kessler, Hartmut, 4,129,929, Cl. 29-25.420.
Schneider, Peter, 4,130,870, Cl. 364-200.000.
Susdorf, Roman; Schuler, Ulrich; and Engelmann, Heinz, 4,130,065, Cl. 105-135.000.
Zibert, Klaus; and Von Basse, Paul W., 4,130,895, Cl. 365-202.000.
SIG Schweizerische Industrie-Gesellschaft: *See—*
Grundler, Bruno; Heinzer, Hans; and Muller, Werner, 4,129,976, Cl. 53-552.000.
Sigma Tau S.p.A. Industrie Farmaceutiche Riunite: *See—*
Cavazza, Claudio, 4,130,116, Cl. 128-203.000.
Silakov, Grigory I.: *See—*
Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Khlopkov, Leonid P.; Nesterovsky, Sergei G.; Starun, Andrei I.; Mironov, Viktor D.; Dibrov, Gennady D.; and Panasenko, Anatoly A., 4,130,439, Cl. 106-67.000.
Silec-Semi-Conducteurs: *See—*
Locqueneux, Rene, 4,130,828, Cl. 357-39.000.
Silver, David A.: *See—*
Bahder, George; Eager, George S., Jr.; and Silver, David A., 4,130,450, Cl. 156-48.000.
Silvermetz, David: *See—*
Adams, George L.; Aker, David; and Silvermetz, David, 4,130,018, Cl. 73-290.00V.
Simkins, Karl L., Jr.: *See—*
Spicer, Larry D.; and Simkins, Karl L., Jr., 4,130,651, Cl. 424-270.000.
Simon, Fernand B.: *See—*
Oneto, Francis E. J.; Benzoni, Andre J. E.; Poret, Jacques L.; and Simon, Fernand B., 4,130,497, Cl. 252-89.00R.
Singer Company, The: *See—*
Law, Joseph P.; and Mack, Alfred R., 4,129,922, Cl. 16-139.000.
Sittig, Wolfgang, to Hoechst Aktiengesellschaft. Mass transfer in liquid media. 4,130,365, Cl. 366-137.000.
Sivachenko, Eugene W.; and Broacha, Firoze H., to Sivachenko, Eugene W. Bridge structure. 4,129,917, Cl. 14-73.000.

Sjoholm, Claes B.; and Martensson, Karl J. G., to Alfa-Laval AB. Apparatus for cutting cheese curd. 4,130,053, Cl. 99-466.000.

SKF Industrial Trading and Development Company B.V.: *See*—
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 4,130,286, Cl. 277-12.000.

Skibbe, Martin O.: *See*—
Enkoji, Takashi; and Skibbe, Martin O., 4,130,514, Cl. 260-8.000.

Slinko, Mikhail G.: *See*—
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.

Slough, Carlton M.; and Romero, Earl M., to Texaco Inc.; and Texas Pipe Line Company, The. Automatic pipe depth locator. 4,130,791, Cl. 324-3.000.

Smart, William L.; Hoenig, Stuart A.; Savitz, Christian W.; and Darlington, Douglas K., to Ransburg Corporation. Grinder apparatus with pollution control fluid dispensing means. 4,129,966, Cl. 51-170.00T.

Smith, Christopher D.: *See*—
Ostrander, Walter M.; Scholl, Malcolm M.; Minott, Edward R.; and Smith, Christopher D., 4,130,174, Cl. 181-146.000.

Smith, Donald E., to Procter & Gamble Company, The. Dermatological compositions. 4,130,643, Cl. 424-238.000.

Smith, Donald E., to Procter & Gamble Company, The. Dermatological compositions. 4,130,667, Cl. 424-361.000.

Smith, Herman W., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-13,14-didehydro-16-phenoxy PGF compounds. 4,130,591, Cl. 568-645.000.

Smith, Herman W., to Upjohn Company, The. Cis-4,5-didehydro-13,14-didehydro-11-deoxy-17-phenyl-18,19,20-trinon-PGE, compounds. 4,130,718, Cl. 560-53.000.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Method and apparatus for determining thermoparticulation temperature of compounds. 4,130,009, Cl. 73-17.00R.

Smith, James M.; and Howe, Wilson S., to Industrial System Engineers, Inc. Apparatus for batch-weighing a continuous flow of material. 4,130,171, Cl. 177-1.000.

Smith, Raymond E., Jr. Elevating device. 4,130,178, Cl. 182-141.000.

Smith & Stone Limited: *See*—
Djurinec, Marijan, 4,130,333, Cl. 339-97.00P.

Smith, William M.: *See*—
Boggs, Brian F.; Zilcosky, Hector J.; and Smith, William M., 4,130,061, Cl. 102-66.000.

Smithkline Corporation: *See*—
Berges, David A., 4,130,644, Cl. 424-246.000.

Smiths Industries Limited: *See*—
Meredith, James F.; and Williams, Brian, 4,130,241, Cl. 235-307.000.

Smolik, Samuel L.: *See*—
Martin, Alton E.; White, Warren D.; and Smolik, Samuel L., 4,130,588, Cl. 260-570.00D.

Smolko, Gennady G.; Vasiliev, Gennady F.; and Chikovani, Nordari M. Passive microcircuit. 4,130,855, Cl. 361-387.000.

Smollin, Charles F., to RCA Corporation. Circuit for rearranging word bits. 4,130,886, Cl. 364-900.000.

Smutny, Viktor, to Ruti Machinery Works Ltd. Band guide roller for band-gripper looms. 4,130,143, Cl. 139-449.000.

Snijders, Wilfred A. M.: *See*—
Van Gerwen, Petrus J.; Van Doorn, Rudolf A.; Snijders, Wilfred A. M.; and Van Essen, Hendrik A., 4,130,806, Cl. 325-487.000.

Snyder, Howard D., Jr.: *See*—
Judd, Carl R.; and Snyder, Howard D., Jr., 4,130,191, Cl. 192-41.00A.

Snyder, John S., Jr., to Communications Satellite Corporation. Analog threshold decoding. 4,130,818, Cl. 340-146.1AQ.

Sobson, Ted P. Portable container having service tower. 4,130,214, Cl. 220-85.00R.

Societa di Elettronica per l'Automazione — SEPA Societa per Azioni: *See*—
Fioretta, Piero; and Richiardi, Claudio, 4,130,873, Cl. 364-513.000.

Societa Italiana Telecomunicazioni Siemens S.P.A.: *See*—
De Marco, Franco; and Panzeri, Constantino, 4,130,736, Cl. 179-16.0EC.

Societe Anonyme de Telecommunications: *See*—
Berniere, Michel G., 4,130,812, Cl. 333-71.000.

Societe Anonyme dite: Etude et Realisation de Chaines Automatiques Erca: *See*—
Hautemont, Jean-Claude H., 4,130,386, Cl. 425-383.000.

Societe Anonyme Francaise du Ferodo: *See*—
de Gennes, Gerard, 4,130,186, Cl. 188-76.000.

Societe Generale de Fonderie: *See*—
Garnier, Regis; and Delpla, Claude, 4,130,136, Cl. 137-625.410.

Soda, Yasuji: *See*—
Nakajima, Tadashi; Soda, Yasuji; Kashima, Kenichi; Kudoh, Haruyoshi; and Miyamoto, Akira, 4,130,571, Cl. 260-403.000.

Sohner, Gerhard: *See*—
Jundt, Werner; Bodig, Bernd; Sohner, Gerhard; Ruf, Walter; Roth, Helmut; and Werner, Peter, 4,130,101, Cl. 123-148.00E.

Sokol, Vincent. Braiding machine with continuous tension filament control. 4,130,046, Cl. 87-48.000.

Solartron Electronic Group Limited, The: *See*—
Wakeling, Antony J., 4,130,723, Cl. 174-68.500.

Solberg, Aasmund, to Angel Mork. Pawl-and-ratchet catch. 4,130,028, Cl. 74-577.00R.

Somasundaran, Ponisseril: *See*—
Nagaraj, D. R.; and Somasundaran, Ponisseril, 4,130,415, Cl. 75-2.000.

Sony Corporation: *See*—
Amano, Kenichi; Suzuki, Yutaka; and Kishi, Yoshio, 4,130,848, Cl. 360-132.000.
Isono, Katsuo; and Sanada, Seiji, 4,130,831, Cl. 358-27.000.
Miyamoto, Toshio; and Hoshido, Mutsuo, 4,130,843, Cl. 360-62.000.
Mogi, Takao; and Okada, Hisao, 4,130,804, Cl. 325-464.000.

Sorenson, John F., to Champion International Corporation. Die cut pad. 4,130,199, Cl. 206-320.000.

South African Inventions Development Corporation: *See*—
Hasson, Victor H.; and von Bergmann, Hubertus M., 4,130,809, Cl. 331-94.5PE.

Souza, Anthony J., to Woodstream Corporation. Universal trigger mechanism for rotating frame animal traps. 4,129,959, Cl. 43-92.000.

Sparrow, David J.; and Van Autgaerden, Willy, to Imperial Chemical Industries Limited. Polyurethane foam containing internal mold-release agent. 4,130,698, Cl. 521-130.000.

Spaulding, Tedford H., to Bunker Ramo Corporation. Electrical connector having a resilient cover. 4,130,327, Cl. 339-17.0CF.

Speck-Pumpen Daniel Speck & Sohni: *See*—
Speck, Walter; and Speck, Willy, 4,130,488, Cl. 210-232.000.

Speck, Walter; and Speck, Willy, to Speck-Pumpen Daniel Speck & Sohni. Device for cleaning and circulating a liquid. 4,130,488, Cl. 210-232.000.

Speck, Willy: *See*—
Speck, Walter; and Speck, Willy, 4,130,488, Cl. 210-232.000.

Spector, George: *See*—
Saethre, Magnus; and Spector, George, 4,130,291, Cl. 280-5.220.

Speier, Rolf: *See*—
Henkelmann, Kurt; Speier, Rolf; and Schafer, Wilhelm, 4,130,353, Cl. 353-85.000.

Spencer, Bette M.: *See*—
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,130,508, Cl. 252-522.000.

Sperry Rand Corporation: *See*—
Best, Donald T., 4,130,846, Cl. 360-120.000.
Horne, Merton A.; and Brillhart, Bruce A., 4,130,897, Cl. 365-205.000.
McMahon, Donald H., 4,130,342, Cl. 350-96.140.
Paul, Maynard C.; and Torok, Ernest J., 4,130,888, Cl. 365-87.000.

Spicer, Larry D.; and Sinkins, Karl L., Jr., to American Cyanamid Company. Butamisole injectable formulations having improved margin of safety in dogs. 4,130,651, Cl. 424-270.000.

Sprecker, Mark A.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.

Spyros, Theodoropulos: *See*—
Hedaya, Eddie; and Spyros, Theodoropulos, 4,130,576, Cl. 260-453.00P.

Stamberg, Jiri: *See*—
Sevcik, Stanislav; Trekoval, Jiri; Holata, Jan; and Stamberg, Jiri, 4,130,705, Cl. 526-230.000.

Stancati, Nicholas, to Thomas & Betts Corporation. Method and means for joining elongate members. 4,129,932, Cl. 29-407.000.

Standard Oil Company, The: *See*—
Jones, Richard H., 4,130,593, Cl. 260-683.480.

Standard Oil Company (Indiana): *See*—
Bockrath, Ronald E.; and Serres, Carl, 4,130,551, Cl. 528-481.000.
Cerefice, Steven A.; Fields, Ellis K.; Marchant, Kerford A., Jr.; and Paschke, Edward E., 4,130,719, Cl. 528-305.000.
Fast, Clarence R.; and King, George E., 4,130,165, Cl. 166-279.060.
Hamilton, Alan D.; Peterson, Gregory P.; and McGuire, Walter R., 4,130,451, Cl. 156-86.000.
Hoff, Glen R.; Melquist, John L.; and Fotis, Peter, 4,130,699, Cl. 526-67.000.

Stanford, George A.: *See*—
Churchill, Arthur E., 4,130,102, Cl. 123-198.00F.

Stange, Klaus K., to Xerox Corporation. Pneumatic registration apparatus. 4,130,274, Cl. 271-236.000.

Stark, Marvin; and Suvada, Steve L., to Pullman Incorporated. Center filler for railway cars. 4,130,068, Cl. 105-420.000.

Starun, Andrei I.: *See*—
Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Silakov, Grigory I.; Khlopkov, Leonid P.; Nesterovsky, Sergei G.; Starun, Andrei I.; Mironov, Viktor D.; Dibrov, Gennady D.; and Panasenko, Anatoly A., 4,130,439, Cl. 106-67.000.

Stauffer Chemical Company: *See*—
Miller, Robert S.; and Doyle, Francis J., 4,130,527, Cl. 260-29.60R.
Muntz, Ronald L., 4,130,552, Cl. 528-285.000.
Pallos, Ferenc M., 4,130,662, Cl. 424-324.000.
Reale, Michael J.; and Jacobs, Barry, 4,130,513, Cl. 521-107.000.
Uhing, Eugene H.; and Toy, Arthur D. F., 4,130,583, Cl. 260-543.00P.

Stauffer, Larry R.: *See*—
Donnelly, Charles W., Sr.; and Stauffer, Larry R., 4,130,040, Cl. 83-389.000.

Steckowich, John, Jr., to Burroughs Corporation. Adjustably interfitting panel clamp. 4,130,262, Cl. 248-226.100.
Steger, John J.: *See*—
Longo, John M.; and Steger, John J., 4,130,492, Cl. 252-18.000.
Steinbauer, David M.: *See*—
Arndt, Richard L.; Meyerhofer, Wilfred L., Jr.; and Steinbauer, David M., 4,130,756, Cl. 235-474.000.
Steiner, Edward L., to Xerox Corporation. Reproduction machine having duplex job recovery capabilities. 4,130,354, Cl. 355-26.000.
Steinhilber, Wilhelm A., to Orion Machinery & Engineering Corp. Wire spooler. 4,130,249, Cl. 242-25.00R.
Stepanov, Jury N.: *See*—
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.
Stern, Gerhard; and Wegleitner, Karlheinz, to Chemie Linz Aktiengesellschaft. Process for the production of foamed plastics with improved combustion characteristics. 4,130,697, Cl. 521-106.000.
Stevens, Raymond L. Machine readable optical printed symbol format. 4,130,243, Cl. 235-487.000.
Stewart, Robert D.; and Schretter, James A., to Crosby Valve & Gage Company. Valve with variable secondary orifice. 4,130,130, Cl. 137-475.000.
Stieff, Lorin R. Fiber optic seal apparatus. 4,130,341, Cl. 350-96.200.
Stork Brabant B.V.: *See*—
Hoelen, Hermanus Josephus Eduardus J. M., 4,130,084, Cl. 118-59.000.
Storm, Donald W. Picker and loader for soft goods. 4,130,314, Cl. 294-100.000.
Strachan, Robert G.: *See*—
Holly, Frederick W.; Paleveda, William J.; Strachan, Robert G.; and Veber, Daniel F., 4,130,554, Cl. 260-112.50R.
Stratienko, Andrew, to Dresser Industries, Inc. Manually shifted actuator. 4,130,030, Cl. 74-625.000.
Streat, Michael, to National Research Development Corporation. Ion exchange materials. 4,130,512, Cl. 521-31.000.
Strigl, Reinhard: *See*—
Hummer, Roland; Thury, Wolfgang; Westerholt, Wilfried; Hollerling, Gundolf; and Strigl, Reinhard, 4,130,419, Cl. 75-130.00R.
Stroganova, Vera V.: *See*—
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.
Stromer, Carl-Axel: *See*—
Lindman, Borje L.; and Stromer, Carl-Axel, 4,130,742, Cl. 179-167.000.
Struble, Glenn E., to Diamond International Corporation. Collapsible or foldable packaging sleeve container. 4,130,237, Cl. 229-40.000.
Suchanek, Walton F., Jr.: *See*—
Dyroff, David R.; and Suchanek, Walton F., Jr., 4,130,635, Cl. 424-48.000.
Sugai, Noriaki: *See*—
Arai, Kojiro; and Sugai, Noriaki, 4,130,465, Cl. 204-27.000.
Sugasawara, Seiji, to Sugatsune Industrial Co., Ltd. Method for manufacturing a door catch made of a synthetic resin. 4,130,621, Cl. 264-230.000.
Sugatsune Industrial Co., Ltd.: *See*—
Sugasawara, Seiji, 4,130,621, Cl. 264-230.000.
Sugiyama, Masatoshi; and Kato, Eiichi, to Fuji Photo Film Co., Ltd. Silver halide light-sensitive material containing dye. 4,130,430, Cl. 96-84.00A.
Sugiyama, Takayuki; and Takahashi, Kihei, to Yoshida Kogyo K. K. Slide fastener. 4,129,928, Cl. 24-205.11R.
Sullivan, John W. Metal detector with feedback tuning. 4,130,792, Cl. 324-3.000.
Sullivan, Timothy J., to Sullivan Valve & Engineering Company, The. Bypass valving fluid control arrangement. 4,130,133, Cl. 137-599.100.
Sullivan Valve & Engineering Company, The: *See*—
Sullivan, Timothy J., 4,130,133, Cl. 137-599.100.
Sumitomo Chemical Company, Limited: *See*—
Hibino, Toshihiko, 4,130,566, Cl. 260-332.20C.
Itoh, Iko; Takahashi, Tsukasa; Takamuku, Shinkichi; Aramaki, Azuma; and Serada, Manabu, 4,130,456, Cl. 159-165.000.
Sumitomo Metal Industries Limited: *See*—
Kaburagi, Katsuhiko; Yamamoto, Yasutaka; and Suzuki, Yutaka, 4,130,389, Cl. 431-183.000.
Sun Chemical Corporation: *See*—
Horwitt, Laurence G.; Mattis, Donald J.; and Greenberger, Harry, 4,130,815, Cl. 338-282.000.
Rosen, George, 4,130,567, Cl. 260-340.90R.
Sun Ventures, Inc.: *See*—
Thompson, Robert M., 4,130,602, Cl. 260-857.0TW.
Sung, Pei; Klaus, Irving; and Lee-You, James, to Johnson & Johnson. Dental constructions and dental alloys. 4,129,944, Cl. 32-8.000.
Susdorf, Roman; Schuler, Ulrich; and Engelmann, Heinz, to Siemens Aktiengesellschaft. Dual axle railway driving truck. 4,130,065, Cl. 105-135.000.
Sushan, Frank M. Door jamb guard. 4,130,311, Cl. 292-346.000.
Suvada, Steve L.: *See*—
Stark, Marvin; and Suvada, Steve L., 4,130,068, Cl. 105-420.000.
Suzuki, Hiroshi: *See*—
Tanaka, Goro; and Suzuki, Hiroshi, 4,130,510, Cl. 260-823.000.
Suzuki, Masayuki: *See*—
Kanno, Kenichi; Suzuki, Masayuki; and Sato, Yuichi, 4,130,464, Cl. 204-1.00T.
Suzuki, Yoshihiro: *See*—
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Suzuki, Yutaka: *See*—
Amano, Kenichi; Suzuki, Yutaka; and Kishi, Yoshio, 4,130,848, Cl. 360-132.000.
Kaburagi, Katsuhiko; Yamamoto, Yasutaka; and Suzuki, Yutaka, 4,130,389, Cl. 431-183.000.
Sventsitsky, Alexandr S.: *See*—
Nudelman, Boris I.; Sventsitsky, Alexandr S.; Bikbau, Marsel Y.; Prikhozhan, Ada M.; and Ibragimov, Isak M., 4,130,441, Cl. 106-89.000.
Swallow, Douglas M., to Sweco, Inc. Bowl shaped screening apparatus. 4,130,478, Cl. 209-254.000.
Swanstrom, H. Wallace; Campbell, Kenneth C.; and Linford, Robin F. G., to Xerox Corporation. Language translating apparatus and methods therefor. 4,130,882, Cl. 364-900.000.
Swanstrom, Kenneth A., to Penn Engineering & Manufacturing Corp. Molded stand-off. 4,130,138, Cl. 138-109.000.
Sweco, Inc.: *See*—
Swallow, Douglas M., 4,130,478, Cl. 209-254.000.
Swenson, Jerry L.: *See*—
Fitch, Lawrence R.; and Swenson, Jerry L., 4,129,919, Cl. 15-302.000.
Sybron Corporation: *See*—
Peeler, Donald H., 4,130,114, Cl. 128-2.05G.
Syntex (U.S.A.) Inc.: *See*—
Ackrell, Jack, 4,130,654, Cl. 424-275.000.
Syracuse Research Corporation: *See*—
Datta, Rabinder S., 4,130,164, Cl. 166-259.000.
Sysoev, Vladimir P.: *See*—
Levin, Efim M.; Sysoev, Vladimir P.; Rudenko, Valery A.; and Pomazan, Oleg K., 4,130,381, Cl. 416-196.00R.
Syva Company: *See*—
Rubenstein, Kenneth E.; and Leute, Richard K., 4,130,462, Cl. 195-103.50A.
Szauer, Tadeusz: *See*—
Boerwinkle, Fred P.; and Szauer, Tadeusz, 4,130,524, Cl. 260-29.6HN.
T. L. Robinson Co., Inc.: *See*—
Robinson, Thomas L., Sr., 4,130,776, Cl. 313-507.000.
Tachino, Kenzo: *See*—
Satoh, Tsuyoshi; and Tachino, Kenzo, 4,130,184, Cl. 187-29.00R.
Takahashi, Kihei: *See*—
Sugiyama, Takayuki; and Takahashi, Kihei, 4,129,928, Cl. 24-205.11R.
Takahashi, Mitsuhiro; Senoo, Tadao; Minekawa, Shigeo; and Hirai, Toshiharu, to Ube-Nitto Kasei Co., Ltd. Strapping band having core formed from a thermosetting resin and a covering formed from a thermoplastic resin. 4,130,686, Cl. 428-294.000.
Takahashi, Tsukasa: *See*—
Itoh, Iko; Takahashi, Tsukasa; Takamuku, Shinkichi; Aramaki, Azuma; and Serada, Manabu, 4,130,456, Cl. 159-165.000.
Takamuku, Shinkichi: *See*—
Itoh, Iko; Takahashi, Tsukasa; Takamuku, Shinkichi; Aramaki, Azuma; and Serada, Manabu, 4,130,456, Cl. 159-165.000.
Takeda, Keiji; and Tsuboi, Masayoshi, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive diazotype materials and process of use. 4,130,426, Cl. 96-49.000.
Takeda, Norio: *See*—
Isshiki, Tomiya; Tomita, Tetsuo; Abe, Mitsuo; and Takeda, Norio, 4,130,586, Cl. 260-566.00R.
Takei, Sakae. Method for manufacturing monolithic semiconductor mask programmable ROM's. 4,129,936, Cl. 29-571.000.
Takeuchi, Takashi: *See*—
Otsuka, Shigeru; Mori, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; Shimoda, Yoshio; Takeuchi, Takashi; Oku, Masakazu; and Mori, Kan, 4,130,668, Cl. 426-287.000.
Talaeva, Irina G.: *See*—
Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.
Tamura, Junichi: *See*—
Otsuka, Shigeru; Mori, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; Shimoda, Yoshio; Takeuchi, Takashi; Oku, Masakazu; and Mori, Kan, 4,130,668, Cl. 426-287.000.
Tamura, Takemasa: *See*—
Akado, Hajime; Ueda, Hiroshi; Yamashita, Akira; and Tamura, Takemasa, 4,130,405, Cl. 55-503.000.
Tanaka, Chiaki; Yoko, Yatabe; and Masanobu, Morikawa, to Toray Industries, Inc. Thermoplastic linear block copolyether-polyesters as hot melt adhesives for textiles. 4,130,603, Cl. 260-860.000.
Tanaka, Goro; and Suzuki, Hiroshi, to Hitachi Chemical Co., Ltd.; and Hitachi, Ltd. Curing of epoxy resin systems using halfester com-

pounds containing aliphatic tertiary amino groups. 4,130,510, Cl. 260-823.000.
Tanaka, Junzo; Orita, Masatomo; and Urashima, Chikao, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,130,749, Cl. 219-10.55B.
Tanida, Hiroshi: *See—*
Hamashima, Yoshio; Tsuji, Teruji; Yoshioka, Mitsuru; Narisada, Masayuki; Komeno, Taichiro; Tanida, Hiroshi; and Nagata, Wataru, 4,130,557, Cl. 260-239.00A.
Tannenberger, Helmut: *See—*
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Tarullo, John A. Cork wall covering. 4,130,685, Cl. 428-247.000.
Tashman, Philip. Top loading waste compactor. 4,130,054, Cl. 100-52.000.
Tate & Lyle Limited: *See—*
Righelato, Renton C.; and Deavin, Lynda, 4,130,461, Cl. 195-31.00P.
Tatematsu, Kazuhisa: *See—*
Sasaki, Shiro; Yasumatsu, Jun; and Tatematsu, Kazuhisa, 4,130,255, Cl. 242-107.100.
Taylor, Colin R., to Pfizer Inc. Methods for treating congestive heart failure and ischemic heart disease. 4,130,647, Cl. 424-251.000.
Taylor, Glenn N. Brace hinge. 4,130,115, Cl. 128-80.00C.
Taylor, Lawrence D.: *See—*
Hardin, Louis W.; and Taylor, Lawrence D., 4,129,996, Cl. 62-262.000.
Taylor, Richard H.: *See—*
Hatter, Edward E.; and Taylor, Richard H., 4,129,948, Cl. 33-27.00C.
Technicon Instruments Corporation: *See—*
Negersmith, Kent M., 4,130,394, Cl. 23-230.00R.
Tektronix, Inc.: *See—*
Anderson, Brent W., 4,130,334, Cl. 339-103.00M.
Perkins, Peter E.; and Blazo, Stephen F., 4,130,775, Cl. 313-397.000.
Teledyne, Inc.: *See—*
Kates, James M.; and Berkovitz, Robert A., 4,130,726, Cl. 179-1.00D.
Kates, James M., 4,130,727, Cl. 179-1.00D.
Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc.: *See—*
Goddard, Terrence P., 4,130,585, Cl. 260-564.00D.
Telefonaktiebolaget L M Ericsson: *See—*
Carlsson, Stig T.; Rasmusson, Bo M.; and Scuka, Viktor, 4,129,992, Cl. 405-164.000.
Lindman, Borje L.; and Stromer, Carl-Axel, 4,130,742, Cl. 179-167.000.
Teleglobe Pay-TV System, Inc.: *See—*
Chomet, Marc, 4,130,833, Cl. 358-122.000.
Tell, Mayo B., to Dayco Corporation. Loop picker. 4,130,142, Cl. 139-159.000.
TenHouten, Edward W.: *See—*
Thirlby, Thomas E., 4,129,957, Cl. 43-42.490.
Tenna Corporation: *See—*
Nagel, Martin J., 4,130,725, Cl. 179-1.00A.
Teradyne, Inc.: *See—*
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Terasawa, Tadao; and Okada, Toshihiko, to Shionogi & Co., Ltd. Novel type of oxa- and thia-steroids. 4,130,565, Cl. 260-327.0TH.
Terni-Societa per l'Industria e l'Elettricita S.p.A.: *See—*
Marianeschi, Edmondo; Basevi, Sandro; Barisoni, Mario; Marini, Paolo; Borgianni, Carlo; and Ricci Bitti, Roberto, 4,130,447, Cl. 148-27.000.
Terumo Corporation: *See—*
Kikugawa, Kiyomi; and Minoshima, Kyoko, 4,130,642, Cl. 424-101.000.
Ter-Zakharian, Julya Z.: *See—*
Tsinker, Maia G.; Ter-Zakharian, Julya Z.; Oganian, Shushanik G.; Ovakimian, Aram R.; Mndzhoian, Shushanik L.; Mndzhoian, Armenak L., deceased; and Mndzhoian, Alza A., administrator, 4,130,559, Cl. 260-239.100.
Texaco Inc.: *See—*
Bridges, James R.; Riedesel, Roland G., Jr.; and Thompson, Larry W., 4,130,793, Cl. 324-6.000.
Slough, Carlton M.; and Romero, Earl M., 4,130,791, Cl. 324-3.000.
Texas Pipe Line Company, The: *See—*
Slough, Carlton M.; and Romero, Earl M., 4,130,791, Cl. 324-3.000.
Textron Inc.: *See—*
Becker, Manfred E., 4,130,324, Cl. 308-36.100.
Carlson, Floyd W.; and Mashman, Joseph, 4,130,259, Cl. 244-83.00F.
Thame, Neville G.: *See—*
Lundberg, Robert D.; and Thame, Neville G., 4,130,517, Cl. 260-29.20N.
Theben-Werk Zeitautomatik GmbH & Co. KG.: *See—*
Schwer, Lukas, 4,130,748, Cl. 200-38.00D.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Apparatus for obtaining a controlled degree of ballast compaction in the tamping and leveling of a track. 4,130,062, Cl. 104-7.00R.
Theurer, Josef; and Praschl, Wilhelm, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Tamping head. 4,130,063, Cl. 104-12.000.
Thirlby, Thomas E., to TenHouten, Edward W., a part interest. Fishing bait harness, fishing lure, and attachment means. 4,129,957, Cl. 43-42.490.
Thomas, Anthony F.: *See—*
Neff, Nelson E.; and Thomas, Anthony F., 4,130,331, Cl. 339-97.00R.
Thomas, Anthony V., to Precision Paper Tube Compay. Apparatus for cutting tubes. 4,130,036, Cl. 82-90.000.
Thomas & Betts Corporation: *See—*
Stancati, Nicholas, 4,129,932, Cl. 29-407.000.
Thomas, Charles H.; and Garland, Barbara R., to Westinghouse Electric Corp. Aqueous polyester coating composition, method of making, and coated conductor. 4,130,520, Cl. 260-29.20N.
Thomas, Paul E., Jr. Liquid dispenser for vehicle and the like. 4,130,145, Cl. 141-88.000.
Thompson, Kenneth L. Radio equipped protective helmet. 4,130,803, Cl. 325-361.000.
Thompson, Larry F.: *See—*
Feit, Eugene D.; and Thompson, Larry F., 4,130,424, Cl. 96-35.100.
Thompson, Larry W.: *See—*
Bridges, James R.; Riedesel, Roland G., Jr.; and Thompson, Larry W., 4,130,793, Cl. 324-6.000.
Thompson, Robert M., to Sun Ventures, Inc. Block copolymer of poly(dioxa-amide) and polyamide. 4,130,602, Cl. 260-857.0TW.
Thompson, Scott B.: *See—*
Zajac, Chester S.; Cockram, Frederick T.; and Thompson, Scott B., 4,130,289, Cl. 279-1.00A.
Thury, Wolfgang: *See—*
Hummer, Roland; Thury, Wolfgang; Westerholt, Wilfried; Hollerling, Gundolf; and Strigl, Reinhard, 4,130,419, Cl. 75-130.00R.
Timmerman, Daniel M.: *See—*
Gilliams, Yvan K.; De Winter, Walter F.; Van Paesschen, August J.; and Timmerman, Daniel M., 4,130,670, Cl. 427-16.000.
Tjornemark, Erik, to Islef & Hagen A/S. Control system for selective positioning of a displaceable device. 4,130,183, Cl. 187-9.00R.
TMC Corporation: *See—*
Horn, Hans, 4,130,297, Cl. 280-618.000.
Tokai Rika Denki Seisakusho: *See—*
Yasumatsu, Jun; Masuda, Noriyuki; and Kubota, Tatsushi, 4,130,254, Cl. 242-107.100.
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Kinoshita, Tsuneo; and Yamazaki, Isamu, 4,130,869, Cl. 364-200.000.
Matsuda, Takashi, 4,130,761, Cl. 250-492.00A.
Minami, Masana, 4,130,348, Cl. 350-162.0SF.
Ono, Masahiko, 4,130,866, Cl. 364-200.000.
Watanabe, Masafumi, 4,130,900, Cl. 365-230.000.
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Toray Industries, Inc.: *See—*
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Comer, Robert C., 4,129,977, Cl. 56-13.400.
Torok, Ernest J.: *See—*
Paul, Maynard C.; and Torok, Ernest J., 4,130,888, Cl. 365-87.000.
Torpey, Wilbur N., to Autotrol Corporation. Wastewater treatment. 4,130,482, Cl. 210-17.000.
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Townsend, David J. Brake actuating devices. 4,130,190, Cl. 192-5.000.
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Toyo Seikan Kaisha, Ltd.: *See—*
Otsuka, Shigeru; Mori, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; Shimoda, Yoshio; Takeuchi, Takashi; Oku, Masakazu; and Mori, Kan, 4,130,668, Cl. 426-287.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
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Ono, Takayoshi, 4,130,222, Cl. 220-373.000.
Ota, Isamu, 4,130,608, Cl. 261-23.00A.
Sasaki, Shiro; Yasumatsu, Jun; and Tatematsu, Kazuhisa, 4,130,255, Cl. 242-107.100.
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Sevcik, Stanislav; Trekoval, Jiri; Holata, Jan; and Stamberg, Jiri, 4,130,705, Cl. 526-230.000.
Tricarico, Joseph R. Exercising device. 4,130,276, Cl. 272-78.000.
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Troller Corporation: *See—*
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Troyanov, Mikhail F.: *See—*
Iljunin, Vladimir G.; Murogov, Viktor M.; Troyanov, Mikhail F.; Rineisky, Anatoly A.; Ustinov, Gennady G.; and Shmelev, Anatoly N., 4,130,460, Cl. 176-68.000.
Tseng, Ching Y.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.
Tsinker, Maia G.; Ter-Zakharian, Julya Z.; Oganian, Shushanik G.; Ovakimian, Aram R.; Mndzhoian, Shushanik L.; Mndzhoian, Armenak L., deceased; and Mndzhoian, Alza A., administrator. Method for the preparation of 6-aminopenicillinic acid derivatives. 4,130,559, Cl. 260-239.100.
Ts'o, Paul O. P.; and Carter, William A. Induction of interferon production by modified nucleic acid complexes. 4,130,641, Cl. 424-85.000.
Tsuboi, Masayoshi: *See—*
Takeda, Keiji; and Tsuboi, Masayoshi, 4,130,426, Cl. 96-49.000.
Tsuchiya, Yoshifumi. Multiple spindle automatic screw machine. 4,130,033, Cl. 82-3.000.
Tsuji, Teruji: *See—*
Hamashima, Yoshio; Tsuji, Teruji; Yoshioka, Mitsuru; Narisada, Masayuki; Komeno, Taichiro; Tanida, Hiroshi; and Nagata, Wataru, 4,130,557, Cl. 260-239.00A.
Turney, Sayles A. Tidal power plant or the like. 4,129,988, Cl. 60-499.000.
Tyco Crystal Products, Inc.: *See—*
Bottom, Virgil E., 4,130,771, Cl. 310-312.000.
Ube-Nitto Kasei Co., Ltd.: *See—*
Takahashi, Mitsuhiro; Senoo, Tadao; Minekawa, Shigeo; and Hirai, Toshiharu, 4,130,686, Cl. 428-294.000.
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Ueno, Ryuzo; and Matsumoto, Hiroyasu, to Kabushiki Kaisha Venoseiyaku oyo Kenkyuso. Process for preparing epoxy resins from hydroxy benzoic acid and bisphenol. 4,130,549, Cl. 528-93.000.
Uhing, Eugene H.; and Toy, Arthur D. F., to Stauffer Chemical Company. Process for preparing alkyl- or arylphosphonothioic dihalides. 4,130,583, Cl. 260-543.00P.
Umetani, Haruki: *See—*
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Union Camp Corporation: *See—*
Barker, Richard G., 4,130,457, Cl. 162-82.000.
Union Carbide Corporation: *See—*
Hedaya, Eddie; and Spyros, Theodoropulos, 4,130,576, Cl. 260-453.00P.
Hoy, Kenneth L.; and Peterson, Roland H., 4,130,523, Cl. 260-29.60R.
Union Insulating Company: *See—*
Kinney, David W., 4,130,335, Cl. 339-122.00R.
Union Oil Company of California: *See—*
Keller, James L., 4,130,148, Cl. 141-218.000.
Uniroyal, Inc.: *See—*
von Schmeling, Bogislav; and Boos, Walter R., 4,130,664, Cl. 424-330.000.
Uniroyal Ltd.: *See—*
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Social Services in Her Britannic Majesty's Government of the: *See—*
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Agriculture: *See—*
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Micheli, Paul L., 4,130,011, Cl. 73-35.000.
Army: *See—*
Abell, William R., 4,129,915, Cl. 14-10.000.
Energy: *See—*
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Nagesh, Voddarahalli K.; and Fulrath, Richard M., deceased, 4,130,671, Cl. 427-125.000.
Rabl, Arnulf; and Winston, Roland, 4,130,107, Cl. 126-270.000.
Wang, John L.; Pickus, Milton R.; and Chen, Meng-Hsiu, 4,130,422, Cl. 75-246.000.
Wojcik, Thaddeus A., 4,130,369, Cl. 403-297.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Flamm, Daniel L.; and Wydeven, Theodore J., Jr. Electric discharge for treatment of trace contaminants. 4,130,490, Cl. 250-531.000.
Grunbaum, Benjamin W. Microelectrophoretic apparatus and process. 4,130,471, Cl. 204-180.00G.
National Aeronautics and Space Administration: *See—*
Frazer, Robert E., 4,130,112, Cl. 128-2.00V.
Giandomenico, Anthony; Dame, James M.; and Behimer, Harold, 4,130,032, Cl. 81-119.000.
Youngbluth, Otto, Jr., 4,130,795, Cl. 324-57.00R.
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Hoople, Gary R., 4,130,823, Cl. 343-768.000.
Kramer, Irvin R., 4,130,466, Cl. 204-38.00A.
Reins, Edward R.; and Curry, Charles D. B., 4,130,887, Cl. 364-900.000.
U.S. Philips Corporation: *See—*
Bousmar, Michel A. M. J.; and Christiaens, Michel J. P., 4,130,724, Cl. 178-69.100.
Dragt, Jan C. W., 4,129,930, Cl. 29-149.50R.
Guildford, Leslie H., 4,130,835, Cl. 358-160.000.
Van Gerwen, Petrus J.; Van Doorn, Rudolf A.; Snijders, Wilfred A. M.; and Van Essen, Hendrik A., 4,130,806, Cl. 325-487.000.
van Heusden, Sybrandus; and Hoogeveen, Leonardus P. J., 4,130,758, Cl. 230-361.00C.
U.S. Terminals, Inc.: *See—*
Dozier, Hilliard, 4,130,336, Cl. 339-273.00R.
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Blackwell, Robert H., Jr., 4,130,377, Cl. 416-132.00R.
Unitek Corporation: *See—*
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University of Illinois Foundation: *See—*
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University of Iowa Research Foundation: *See—*
Lindquist, Everet F., 4,130,283, Cl. 273-195.00A.
University of Southern California: *See—*
Frasher, Wallace G.; Netto, Daniel J.; and Marcus, Carol S., 4,130,757, Cl. 250-336.000.
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UOP Inc.: *See—*
Hayes, John C., 4,130,507, Cl. 252-439.000.
Loboda, Robert S., 4,130,476, Cl. 208-212.000.
Upjohn Company, The: *See—*
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Bundy, Gordon L., 4,130,720, Cl. 560-61.000.
Bundy, Gordon L.; and Nelson, Norman A., 4,130,721, Cl. 560-121.000.
Kelly, Robert C., 4,130,569, Cl. 260-345.200.
Lednicer, Daniel, 4,130,561, Cl. 546-204.000.
Smith, Herman W., 4,130,591, Cl. 568-645.000.
Smith, Herman W., 4,130,718, Cl. 560-53.000.
Wight, Hewitt G.; Call, Tracey G.; and Mortensen, Marvin L., 4,130,578, Cl. 260-455.00A.
Urashima, Chikao: *See—*
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Urbach, John C.; and Cheng, David, to Xerox Corporation. Motion blur compensation for moving media optical data recording system. 4,130,898, Cl. 365-215.000.
Usami, Kiyoshi, to Nippondenso Co., Ltd. Evaporation pressure control device. 4,129,995, Cl. 62-217.000.
Uskokovic, Milan R.: *See—*
Baggiolini, Enrico G.; Lee, Hsi L.; and Uskokovic, Milan R., 4,130,713, Cl. 548-303.000.
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,130,568, Cl. 260-343.210.
Ustinov, Gennady G.: *See—*
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Valantin, Alfred, to Charbonnages de France. Advancing support. 4,129,990, Cl. 405-299.000.
Valdiserri, Leo L.; and Bullock, Elyse M., to Borg-Warner Corporation. Olefin polymers stable to copper. 4,130,540, Cl. 260-45.80R.

Van Autgaerden, Willy: *See—*
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Van Ballegooijen, Hendrik; Binsbergen, Frederik L.; Raadsen, Jacob; and Vreugdenhil, Arie D., to Shell Oil Company. Rubber compositions. 4,130,606, Cl. 260-894.000.
van Bilderbeek, Ben H., to Vetco, Inc. Single point mooring apparatus. 4,130,076, Cl. 114-230.000.
Van Den Berghe, Paul; and Tannenberger, Helmut. Electrolyte-cathode assembly for a fuel cell. 4,130,693, Cl. 429-41.000.
van der Lely, Cornelis. Soil cultivating implements. 4,130,167, Cl. 172-40.000.
Vandling, John M., to Exxon Research & Engineering Co. Method and apparatus for coupling facsimile signals to a telephone network. 4,130,840, Cl. 358-281.000.
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Van Doorselaer, Marcel K., to Agfa-Gevaert, N.V. Combination of photosensitive elements suited for use in radiography. 4,130,428, Cl. 96-68.000.
Van Doorselaer, Marcel K., to Agfa-Gevaert, N.V. Combination of photosensitive elements suited for use in radiography. 4,130,429, Cl. 96-82.000.
Van Eck, William F. Hypodermic syringe. 4,130,117, Cl. 128-216.000.
Van Essen, Hendrik A.: *See—*
Van Gerwen, Petrus J.; Van Doorn, Rudolf A.; Snijders, Wilfred A. M.; and Van Essen, Hendrik A., 4,130,806, Cl. 325-487.000.
van Essen, Uilke, to Pollutex Milieutechniek B.V. Method and device for the separation of a liquid-containing mixture. 4,130,486, Cl. 210-78.000.
Van Gerwen, Petrus J.; Van Doorn, Rudolf A.; Snijders, Wilfred A. M.; and Van Essen, Hendrik A., to U.S. Philips Corporation. Filter and demodulation arrangement. 4,130,806, Cl. 325-487.000.
van Heusden, Sybrandus; and Hoogeveen, Leonardus P. J., to U.S. Philips Corporation. Device for determining gaseous components. 4,130,758, Cl. 250-361.00C.
Van Paesschen, August J.: *See—*
Gilliams, Yvan K.; De Winter, Walter F.; Van Paesschen, August J.; and Timmerman, Daniel M., 4,130,670, Cl. 427-16.000.
Van Poucke, Raphael K.: *See—*
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Boreskov, Georgy K.; Slinko, Mikhail G.; Gelbshtein, Anatoly I.; Vasilevich, Lidia A.; Chesnokov, Boris B.; Frolkina, Irina T.; Dyment, Oskar N.; Stepanov, Jury N.; Davydov, Valery A.; Talaeva, Irina G.; Utkina, Ninel S.; Stroganova, Vera V.; Aksenova, Maria S.; Filippova, Anna G., deceased; Prosvirova, Olga B., administrator; and Zakharova, Irina B., administrator, 4,130,570, Cl. 260-348.350.
Vasilevskis, Janis, to Hoffmann-La Roche Inc. Synthesis of biotin. 4,130,712, Cl. 548-303.000.
Vasiliev, Gennady F.: *See—*
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Vassiliou, Eustathios; and Welch, Edward J., to Du Pont de Nemours, E. I., and Company. Polyarylene sulfide resin coating method. 4,130,675, Cl. 427-333.000.
Vaughan, Paul R.; and Vaughan, Susan E. Toilet seat handle. 4,129,907, Cl. 4-251.000.
Vaughan, Susan E.: *See—*
Vaughan, Paul R.; and Vaughan, Susan E., 4,129,907, Cl. 4-251.000.
Veber, Daniel F.: *See—*
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Velenovsky, Joseph J.; and Alvarez, Manuel, to FMC Corporation. Control of halomethyl ether emissions. 4,130,629, Cl. 423-240.000.
Vetco, Inc.: *See—*
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Vickers Shipbuilding Group Limited: *See—*
Braddyll, John R. G.; Aubrey, Joseph H.; Shaw, Ernest A.; and Palmer, Ian, 4,130,366, Cl. 366-288.000.
Videoprint Gesellschaft fur Industrie-Fernsehen mbH: *See—*
Mender, Adolf; and Schmidt, Horst, 4,130,834, Cl. 358-127.000.
Villante, Francis J.: *See—*
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Vinals, Joaquin: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.
Vinals, Joaquin F.: *See—*
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Vock, Manfred H.: *See—*
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Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,130,587, Cl. 260-586.00G.
Vogel, Charles B.; and Worrell, Gene T., to Shell Oil Company. Circumferential acoustical detector. 4,130,816, Cl. 340-15.5BH.
Vogt, B. Richard; and Cullison, David A., to E. R. Squibb & Sons, Inc. 1,2,3,4-Tetrahydro-2-((4-(phenyl)-1-piperazinyl)methyl)-1-naphthalenols and derivatives and analogs thereof. 4,130,646, Cl. 424-250.000.
Vogt, Wilhelm; and Richtzenhain, Herman, to Dynamit Nobel Aktiengesellschaft. Method for the preparation of chloroacetaldehydedimethyl acetal. 4,130,592, Cl. 568-604.000.
Volertas, Vytas F.: *See—*
Nossen, Edward J.; and Volertas, Vytas F., 4,130,802, Cl. 325-30.000.
Von Basse, Paul W.: *See—*
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von Bergmann, Hubertus M.: *See—*
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von Schmeling, Bogislav; and Boos, Walter R., to Uniroyal, Inc.; and Uniroyal Ltd. (Bis(diphenylaminomethane) antimicrobial agents. 4,130,664, Cl. 424-330.000.
Vos, Cornelis: *See—*
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Vought Corporation: *See—*
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Vreugdenhil, Arie D.: *See—*
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Vugrin, Augustin. Guide bushing for rotary tool. 4,130,372, Cl. 408-72.00R.
W. J. Industries, Incorporated: *See—*
Eddens, Gerald R., 4,130,014, Cl. 73-144.000.
W. R. Grace & Co.: *See—*
Wszolek, Walter R., 4,130,213, Cl. 215-349.000.
WABCO Westinghouse: *See—*
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Wachter, Michael P.; and Kanojia, Ramesh M., to Ortho Pharmaceutical Corporation. Chemical products and methods. 4,130,556, Cl. 260-236.300.
Wacker-Chemie GmbH: *See—*
Leiser, Manfred; Wegehaupt, Karl-Heinrich; and Marsch, Wilhelm, 4,130,707, Cl. 528-15.000.
Wacker-Chemitronic Gesellschaft fur Elecktronik-Grundstoffe mbH: *See—*
Braunsperger, Johann; Lang, Winfried; and Zainer, Thorgard, 4,130,632, Cl. 423-342.000.
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Wade, Kenneth R., to Pactrol Controls Limited. Control systems. 4,130,753, Cl. 219-492.000.
Wagner, Helmut; and Neumann, Hans-Joachim. Use of betaines in mineral oil recovery. 4,130,491, Cl. 252-8.55D.
Wagner, Robert F., to Sealy, Inc. Foundation unit with cushioned cross rails. 4,129,908, Cl. 5-35.000.
Wainscott, William E.: *See—*
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Wakasa, Isao; Kawaguchi, Yutaka; and Shono, Hiroaki, to Nitto Boseki Co., Ltd. Method of detecting breakage of glass fiber filament. 4,130,406, Cl. 65-2.000.
Wakeling, Antony J., to Solartron Electronic Group Limited, The. Printed circuit with laterally displaced ground and signal conductor tracks. 4,130,723, Cl. 174-68.500.
Walker, Brian: *See—*
Hunter, George S.; Hunter, Susanne P.; and Walker, Brian, 4,130,487, Cl. 210-85.000.
Walker, Laurine L. Collapsible ski pole seat. 4,130,294, Cl. 280-11.37E.
Walker, Lynn C., to Dow Chemical Company, The. Adiabatic calorimeter apparatus and method for measuring the energy change in a chemical reaction. 4,130,016, Cl. 73-190.00R.
Walker, Richard K., to Ohaus Scale Corporation. Piezo-electric disc mounting methods and apparatus. 4,130,624, Cl. 310-328.000.
Walker, William C. String instrument tuning system. 4,130,045, Cl. 84-297.00R.
Wallace, Dean R., to Airco, Inc. Method of making endotracheal tube cuffs. 4,130,617, Cl. 264-528.000.
Wallace, Ronald M., to Raytheon Company. Solid state power combiner. 4,130,810, Cl. 331-107.00R.
Walsh, Arthur M.; and Ruckdeschel, Frederick R., to Xerox Corporation. Variable frequency half-tone imaging apparatus. 4,130,841, Cl. 358-298.000.
Walter, John, to Continental Group, Inc., The. Easy opening end closure for a container. 4,130,218, Cl. 220-268.000.
Walter, John O., to General Motors Corporation. Method of embossing. 4,130,623, Cl. 264-293.000.
Waltrip, Owen R., to Nuclear Supreme. Sewage treating and conversion process. 4,130,483, Cl. 210-40.000.
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B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977	B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977	B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977	B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977	B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977	B 405,899	4,097,710	Mar. 23, 1976	Mar. 21, 1978
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977	B 411,471	3,982,933	Feb. 17, 1975	Sep. 28, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 412,023	4,130,788	Apr. 6, 1978	Dec. 19, 1978
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976	B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976	B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976	B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976	B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977	B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977	B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976	B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977	B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976	B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977	B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976	B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976	B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976	B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977	B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976	B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976	B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977	B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977	B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976	B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976	B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977	B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976	B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977	B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977	B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977	B 449,837	4,128,582	Mar. 2, 1976	Dec. 5, 1978
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977	B 449,989	4,061,572	Mar. 30, 1976	Dec. 6, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,257	4,078,715	Jan. 13, 1976	Mar. 14, 1978
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977
B 471,706	4,076,275	Mar. 16, 1976	Feb. 28, 1978
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 475,801	4,056,759	Mar. 30, 1976	Nov. 1, 1977
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977
B 494,167	4,129,977	Mar. 23, 1976	Dec. 19, 1978
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,439	4,057,521	Apr. 13, 1976	Nov. 8, 1977
B 494,440	4,056,502	Feb. 17, 1976	Nov. 1, 1977
B 494,450	4,079,029	Feb. 17, 1976	Mar. 14, 1978
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,124	4,060,968	Mar. 9, 1976	Dec. 6, 1977
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,490	4,118,377	Mar. 23, 1976	Oct. 3, 1978
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,128	4,072,723	Feb. 24, 1976	Feb. 7, 1978
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,773	4,125,406	Jan. 13, 1976	Nov. 14, 1978
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,456	4,080,349	Mar. 9, 1976	Mar. 21, 1978
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,640	4,130,505	Feb. 17, 1976	Dec. 19, 1978
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,346	4,124,330	Mar. 9, 1976	Nov. 7, 1978
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,216	4,076,261	Feb. 17, 1976	Feb. 28, 1978
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 537,990	4,057,651	Jan. 13, 1976	Nov. 8, 1977
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 632,416	4,076,698	Mar. 9, 1976	Feb. 28, 1978
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF DECEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Addressograph-Multigraph Corporation: *See*—
Szabo, Francis S., Re. 29,864, Cl. 355-41.000.

Bodig, Bernd: *See*—
Roozenbeek, Herman; Bodig, Bernd; Meyer, Klaus; and Fritz, Adolf, Re. 29,862, Cl. 123-148.00E.

Cleveland, Joseph J.: *See*—
Steigelman, James Q.; Cleveland, Joseph J.; Kleiner, Richard N.; and Rymas, Frank, Re. 29,865, Cl. 75-240.000.

Dagragnano, Victor L.: *See*—
Schontzler, James G.; Gates, Wendall C.; and Dagragnano, Victor L., Re. 29,868, Cl. 364-510.000.

De Lew, Charles A.: *See*—
Kozel, James A.; and De Lew, Charles A., Re. 29,863, Cl. 137-242.000.

Dietschy, Robert; and Hexel, Georges, to Edouard Dubied et Cie. Stitch presser for knitting machine. Re. 29,861, Cl. 66-64.000.

Edouard Dubied et Cie: *See*—
Dietschy, Robert; and Hexel, Georges, Re. 29,861, Cl. 66-64.000.

Fritz, Adolf: *See*—
Roozenbeek, Herman; Bodig, Bernd; Meyer, Klaus; and Fritz, Adolf, Re. 29,862, Cl. 123-148.00E.

Gates, Wendall C.: *See*—
Schontzler, James G.; Gates, Wendall C.; and Dagragnano, Victor L., Re. 29,868, Cl. 364-510.000.

Gould, Incorporated: *See*—
Stedman, Cecil K., Re. 29,867, Cl. 338-2.000.

GTE Sylvania Incorporated: *See*—
Steigelman, James Q.; Cleveland, Joseph J.; Kleiner, Richard N.; and Rymas, Frank, Re. 29,865, Cl. 75-240.000.

Hexel, Georges: *See*—
Dietschy, Robert; and Hexel, Georges, Re. 29,861, Cl. 66-64.000.

Kleiner, Richard N.: *See*—
Steigelman, James Q.; Cleveland, Joseph J.; Kleiner, Richard N.; and Rymas, Frank, Re. 29,865, Cl. 75-240.000.

Kozel, James A.; and De Lew, Charles A., to Singer Company, The. Anti-contaminant diaphragm valve. Re. 29,863, Cl. 137-242.000.

Manning Environmental Corporation: *See*—
Schontzler, James G.; Gates, Wendall C.; and Dagragnano, Victor L., Re. 29,868, Cl. 364-510.000.

Meyer, Klaus: *See*—
Roozenbeek, Herman; Bodig, Bernd; Meyer, Klaus; and Fritz, Adolf, Re. 29,862, Cl. 123-148.00E.

Nippon Electric Company, Limited: *See*—
Yonezu, Hiroo, Re. 29,866, Cl. 331-94.50H.

Robert Bosch GmbH: *See*—
Roozenbeek, Herman; Bodig, Bernd; Meyer, Klaus; and Fritz, Adolf, Re. 29,862, Cl. 123-148.00E.

Roozenbeek, Herman; Bodig, Bernd; Meyer, Klaus; and Fritz, Adolf, to Robert Bosch GmbH. Ignition system dependent upon engine speed. Re. 29,862, Cl. 123-148.00E.

Rymas, Frank: *See*—
Steigelman, James Q.; Cleveland, Joseph J.; Kleiner, Richard N.; and Rymas, Frank, Re. 29,865, Cl. 75-240.000.

Schontzler, James G.; Gates, Wendall C.; and Dagragnano, Victor L., to Manning Environmental Corporation. Fluid flow measuring system and method. Re. 29,868, Cl. 364-510.000.

Singer Company, The: *See*—
Kozel, James A.; and De Lew, Charles A., Re. 29,863, Cl. 137-242.000.

Stedman, Cecil K., to Gould, Incorporated. Pressure sensitive diaphragms with stress null zone oriented bridge patterns. Re. 29,867, Cl. 338-2.000.

Steigelman, James Q.; Cleveland, Joseph J.; Kleiner, Richard N.; and Rymas, Frank, to GTE Sylvania Incorporated. Cast cemented refractory metal carbides having improved sintered density. Re. 29,865, Cl. 75-240.000.

Szabo, Francis S., to Addressograph-Multigraph Corporation. Method of and apparatus for multi-galley composition. Re. 29,864, Cl. 355-41.000.

Yonezu, Hiroo, to Nippon Electric Company, Limited. Double heterostructure stripe geometry semiconductor laser device. Re. 29,866, Cl. 331-94.50H.

LIST OF PLANT PATENTEES

Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara": *See*—
Holtkamp, Reinhold, 4,348, Cl. 69.000.
Holtkamp, Reinhold, 4,349, Cl. 69.000.
Holtkamp, Reinhold, 4,350, Cl. 69.000.
Holtkamp, Reinhold, 4,351, Cl. 69.000.
Holtkamp, Reinhold, 4,352, Cl. 69.000.
Holtkamp, Reinhold, 4,353, Cl. 69.000.

Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant. 4,348, 12-19-78, Cl. 69.000.

Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant. 4,349, 12-19-78, Cl. 69.000.

Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant. 4,350, 12-19-78, Cl. 69.000.

Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant. 4,351, 12-19-78, Cl. 69.000.

Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant. 4,352, 12-19-78, Cl. 69.000.

Holtkamp, Reinhold, to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara". African violet plant. 4,353, 12-19-78, Cl. 69.000.

LIST OF DESIGN PATENTEES

Altec Corporation: *See*—
Nussdorfer, Dale A.; and Hayes, William L., 250,586, Cl. D14-30.000.

Ambrosio, Louis A.; Benedetti, Robert L.; and Sinatra, Angelo, to Western Electric Company, Incorporated. Public telephone enclosure or the like. 250,602, 12-19-78, Cl. D25-16.000.

Andreadakis, Nicholas C.: *See*—
Mayer, William N.; Kirchner, Richard K.; and Andreadakis, Nicholas C., 250,588, Cl. D14-43.000.

Atari, Inc.: *See*—
Hall, Randy K.; and McKinsey, Kevin P., 250,606, Cl. D34-5.00R.
McKinsey, Kevin P.; and Hayashi, John K., 250,607, Cl. D34-5.00R.
Nelson, Jeffrey O.; and Lee, Hugh M., 250,608, Cl. D34-5.00R.

Avise, Donald L.: *See*—
McNair, Samuel L.; Avise, Donald L.; and Talge, Foster L., 250,566, Cl. D7-88.000.

Barlow, Gordon A.; and Imatt, Alex, to Marvin Glass & Associates. Toy vehicle. 250,611, 12-19-78, Cl. D34-15.0MM.

Baxter Travenol Laboratories, Inc.: *See*—
Gelbman, Alexander; Soodak, Charles I.; Hauser, Stephen G.; Bruni, James G.; and Fordham, Willard E., 250,587, Cl. D14-42.000.

Belinkoff, Irving R., to Kidde Consumer Durables Corp. Food processor. 250,568, 12-19-78, Cl. D7-153.000.

Beman, Deane R.: *See*—
Safer, John H., 250,582, Cl. D11-131.000.

Benedetti, Robert L.: *See*—
Ambrosio, Louis A.; Benedetti, Robert L.; and Sinatra, Angelo, 250,602, Cl. D25-16.000.

Boyle, Allan John. Bottle. 250,574, 12-19-78, Cl. D9-108.000.

Breger, Carl-Arne, to Shapes Establishment. Knife handle. 250,567, 12-19-78, Cl. D7-152.000.

Brown, Leonard: *See—*
Shorin, Arthur T.; and Brown, Leonard, 250,556, Cl. D1-22.000.

Bruni, James G.: *See—*
Gelbman, Alexander; Soodak, Charles I.; Hauser, Stephen G.; Bruni, James G.; and Fordham, Willard E., 250,587, Cl. D14-42.000.

Buck Stove Marketing Corporation: *See—*
Buckner, Carrol E., 250,598, Cl. D23-97.000.

Buckner, Carrol E., to Buck Stove Marketing Corporation. Stove. 250,598, 12-19-78, Cl. D23-97.000.

Burd, Inc., Howell Division: *See—*
Petersen, Warren D., 250,559, Cl. D6-56.000.

Caburian, Eugenio D.: *See—*
Evangelista, Bisked U.; and Caburian, Eugenio D., 250,573, Cl. D9-66.000.

Champion International Corporation: *See—*
Cohn, Robert; and Young, Charles M., 250,590, Cl. D19-3.000.

Cohn, Robert; and Young, Charles M., to Champion International Corporation. Envelope blank. 250,590, 12-19-78, Cl. D19-3.000.

Corco, Inc.: *See—*
Sneeden, John R.; and Schrader, George L., 250,572, Cl. D9-52.000.

Corning Glass Works: *See—*
Stowell, Davin B., 250,565, Cl. D7-20.000.

Dazey Products Company: *See—*
McNair, Samuel L.; Avise, Donald L.; and Talge, Foster L., 250,566, Cl. D7-88.000.

Denaro, Joseph M.: *See—*
Pick, Ernest W.; Denaro, Joseph M.; and Goerke, Henry R., 250,600, Cl. D24-61.000.
Pick, Ernest W.; Denaro, Joseph M.; and Goerke, Henry R., 250,601, Cl. D24-61.000.

Detroit Tool and Engineering Company: *See—*
Miner, Earl L.; and Jones, Harold G., 250,583, Cl. D12-1.000.

DeWeese, Ralph M. Advertising mast or similar article. 250,615, 12-19-78, Cl. D96-12.00D.

Donnelly, William B., to General Electric Company. Chime housing. 250,579, 12-19-78, Cl. D10-118.000.

Dunlop Limited: *See—*
Morgan, Peter W. S., 250,558, Cl. D2-215.000.

Elliott, Richard M.; Unger, Steve A.; Mercadante, Michael J.; Urbanus, David S.; and Fossella, Gregory F., to USM Corporation. Hand-held hot melt dispenser. 250,570, 12-19-78, Cl. D8-30.000.

Evangelista, Bisked U.; and Caburian, Eugenio D. Bottle. 250,573, 12-19-78, Cl. D9-66.000.

Fabri-Tek Incorporated: *See—*
Hoffman, Gerald F., 250,576, Cl. D10-60.000.

Fan, Tsui. Portable table lamp. 250,612, 12-19-78, Cl. D48-20.00R.

Fire Drum Corporation: *See—*
Jonas, Gerald L., 250,596, Cl. D23-97.000.

Fordham, Willard E.: *See—*
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Gardner, David. Dual eye wash fountain. 250,594, 12-19-78, Cl. D23-34.000.

Gelbman, Alexander; Soodak, Charles I.; Hauser, Stephen G.; Bruni, James G.; and Fordham, Willard E., to Baxter Travenol Laboratories, Inc. Computational module. 250,587, 12-19-78, Cl. D14-42.000.

General Electric Company: *See—*
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Getner, Edwin S. Stand for supporting an ice bucket, pot, vase or similar article. 250,563, 12-19-78, Cl. D6-176.000.

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Goodman, L. Neil; and Kubasta, Charles J., to Xerox Corporation. Ribbon cartridge with ribbon. 250,613, 12-19-78, Cl. D64-11.00A.

Gordon, Kenneth S. Eyeglass rack. 250,560, 12-19-78, Cl. D6-85.000.

Gordon, Kenneth S. Eyeglass rack. 250,564, 12-19-78, Cl. D6-188.000.

Greene, Robert L. Wall mountable radio transceiver for use with a cordless telephone. 250,589, 12-19-78, Cl. D14-68.000.

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McKinsey, Kevin P.; and Hayashi, John K., to Atari, Inc. Game control console. 250,607, 12-19-78, Cl. D34-5.00R.

McKinsey, Kevin P.: *See—*
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McNair, Samuel L.; Avise, Donald L.; and Talge, Foster L., to Dazey Products Company. Doughnut cooker or similar article. 250,566, 12-19-78, Cl. D7-88.000.

Meis, William J. Mobile support platform for vehicles. 250,585, 12-19-78, Cl. D12-31.000.

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Mitutoyo Manufacturing Company, Ltd.: *See—*
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Oye, Lloyd J., to Trans-Aid Corporation. Combination medical supply cart and cabinet. 250,584, 12-19-78, Cl. D12-28.000.

Petersen, Warren D., to Burd, Inc., Howell Division. Chair or similar article. 250,559, 12-19-78, Cl. D6-56.000.

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Pick, Ernest W.; Denaro, Joseph M.; and Goerke, Henry R., to Purdue Frederick Company, The. Cannula. 250,600, 12-19-78, Cl. D24-61.000.

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Roesch, Edgar B., to Roesch Trust, The, Lesley B. Roesch and Robert Patterson, trustees. Lower sash window. 250,603, 12-19-78, Cl. D25-52.000.

Roesch, Edgar B., to Roesch Trust, The, Lesley B. Roesch and Robert Patterson, trustees. Upper sash window. 250,604, 12-19-78, Cl. D25-52.000.

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St. Amand, Elmer F. Transfer pipette. 250,599, 12-19-78, Cl. D24-55.000.
Savage, David. Pendant. 250,581, 12-19-78, Cl. D11-72.000.
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Smith, Raymond A. Handle support for weed cutting implements. 250,569, 12-19-78, Cl. D8-8.000.
Sneeden, John R.; and Schrader, George L., to Corco, Inc. Bottle or the like. 250,572, 12-19-78, Cl. D9-52.000.
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Stewart, Anne R. Handbag. 250,614, 12-19-78, Cl. D87-3.00F.
Stowell, Davin B., to Corning Glass Works. Bowl or the like. 250,565, 12-19-78, Cl. D7-20.000.
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Tebbe, David L.; and Klund, Eugene E., to Lam Craft Industries, Inc. Portable sink. 250,595, 12-19-78, Cl. D23-59.000.
Testro, Keith R.; and Testro, Rex C. Stationery folder. 250,591, 12-19-78, Cl. D19-26.000.
Testro, Keith R.; and Testro, Rex C. Stationery folder. 250,592, 12-19-78, Cl. D19-26.000.
Testro, Keith R.; and Testro, Rex C. Stationery folder. 250,593, 12-19-78, Cl. D19-26.000.
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Testro, Keith R.; and Testro, Rex C., 250,592, Cl. D19-26.000.
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Urbanus, David S.: *See*—
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USM Corporation: *See*—
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Western Electric Company, Incorporated: *See*—
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Whipple, Roy. Stove with glass window. 250,597, 12-19-78, Cl. D23-97.000.
Winslow, Peter L. Boat cleat. 250,571, 12-19-78, Cl. D8-382.000.
Wynn, Freddie L. Skate board scooter. 250,610, 12-19-78, Cl. D34-15.0AJ.
Xerox Corporation: *See*—
Goodman, L. Neil; and Kubasta, Charles J., 250,613, Cl. D64-11.00A.
Young, Charles M.: *See*—
Cohn, Robert; and Young, Charles M., 250,590, Cl. D19-3.000.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 19, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

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1.913	4,129,903

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310	4,130,687
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	130	250,561
	141	250,562
	176	250,563
	188	250,564
D7—	20	250,565
	88	250,566
	152	250,567
	153	250,568
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	30	250,570
	382	250,571
D9—	52	250,572
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	108	250,574
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	65	250,577
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